U.S. DEPARTMENT OF COMMERCE
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PATENT PROFILES

SOLAR ENERGY

SOLAR ENERGY • JANUARY 1980

PATENT PROFILES

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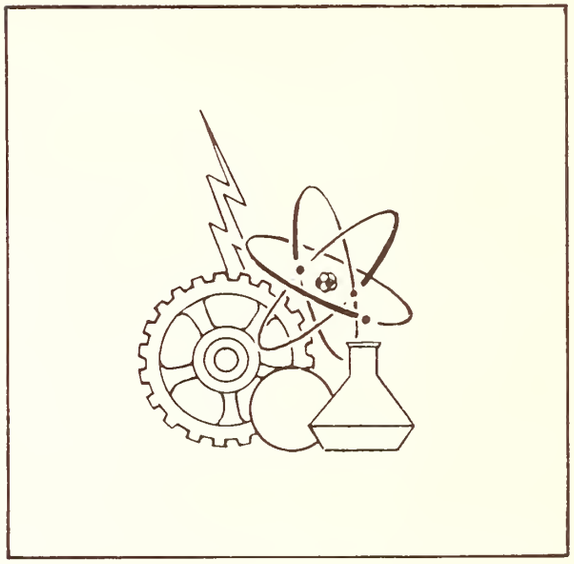

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INTRODUCTION

Background

Patents, as incentives for innovation, are well established in the U.S. free-enterprise system. Often overlooked, however, is a second great benefit of the patent system: the enormous, continually expanding patent file. This file includes more than 4 million distinct U.S. patents. These patents are classified and cross-referenced among the approximately 100,000 categories of technology that make up the U.S. Patent Classification System. Along with similarly categorized foreign patents and other technical publications they make up a collection totaling more than 23 million documents -- a collection which grows by over half a million documents annually.

Patent law requirements for a full disclosure of invention (which is then published as part of a patent grant) have resulted in an unique assemblage of technological information. Not only does the patent file embody the most comprehensive collection of technical information of its kind in the world, the information is inherently presented in a manner such that nearly every significant development in almost all technical fields flows in a natural time-series sequence -- virtually welcoming monitoring and analysis.

In its own unique way, this file represents a national resource. The Patent and Trademark Office (PTO) recognizes it heavy responsibilities not only to preserve, maintain, and improve the file, but, as well, to maximize its use for the greatest public benefit. It was as part of its effort to discharge this latter responsibility that the Patent and Trademark Office established, in 1971, its technology assessment and forecast program.

In its most general terms, the mission of the program is to stimulate and enhance the use and usability of the patent file, and to assemble, analyze and make available meaningful data about the file. In carrying out this mission, the Office of Technology Assessment and Forecast (OTAF), which administers the program, has assembled and built a master data base covering all U.S. patents. This data base has been used to support: (1) the preparation of a series of nine OTAF general distribution publications (see Appendix B); and (2) OTAF's special report services (see Appendix C).

Patent Profiles

In an effort to continually provide data in a form which is useful and convenient to the interested reader, OTAF is now presenting a new publication series -- PATENT PROFILES. Each of these publications will deal with a specific technological area and will survey the patent activity of that area for a given period of time.

PATENT PROFILES provides many different kinds of information about a particular area of the patent file and assembles this information in a format which enables the user to extract the information needed or to collect necessary data to lead to the desired information.

Thus, interested users, both technically and non-technically oriented, from the public and private sectors, will be able to gain insight into what is being done in a technology, who is doing it, where it is being done and in what direction the technology is headed.

The objective of these publications is to use the U.S. patent file as a prime reference source in significantly adding to the universe of knowledge from which future inventors and innovators draw, and upon which corporate and public policy planners rely.

Solar Energy

Energy plays an essential role in virtually all aspects of our economy. With the rising costs of oil, and now, the increasing threat to the availability of foreign oil at any price, it is not surprising, therefore, that the pressure to be inventive in meeting an energy shortage has become a national challenge. Thus, technologists are turning their efforts toward a number of energy alternatives, seeking ways to create new or synthetic fuels (reviewed in our first issue of PATENT PROFILES, December, 1979) and techniques to harness our vastly abundant natural endowments, termed collectively as SOLAR ENERGY.

The term solar energy is becoming synonomous with a widespread industry involving many technologies. These include not only the use of the sun's heat and light, through such developments as solar cells and panels, collectors and concentrators, but also the use of other natural resources such as wind, tide and wave, and geothermal and other natural terrestrial heat energy.

The portions of the U.S. patent file identified as pertinent to the various fields of solar energy have grown dramatically in recent years -- expanding by a total of 1218 U.S. patent documents in the three year period 1976-1978. Interestingly, this overall upward trend, in most segments of solar technology, is due primarily to domestic efforts. This is particularly significant at a time when many other technologies are experiencing both a domestic patenting decline and a sharp increase in foreign origin U.S. patenting. A review of the patenting statistics given in the profile of each solar energy category reveals much about what is happening in this growing industry.

EXPLANATION OF DATA AND FORMAT

This report presents profiles of patenting* in five major areas of solar energy technology, and in the related areas of wind, geothermal and tide and wave energy. Each of the profiles is divided into three parts:

PART 1

Part 1, the first page of each profile, identifies the area which is examined, lists the pertinent U.S. Patent Classification(s) involved, and graphically illustrates patent activity (across a designated 10-year span) in two ways: (1) by the patent grant date; (2) by the granted patents' application filing date. The latter method presents what is often considered a more useful measurement tool since application filing dates are closer in time to the actual development of the technology disclosed in the patent and are independent of PTO production variance.** Levels of involvement by foreign residents, corporations, and government agencies in recent U.S. patent activity, as well as a measure of relative growth in the particular technological area are presented in the "Activity Indices" (defined below).

EXAMPLE

DIRECT CONVERSION OF SOLAR ENERGY TO MECHANICAL ENERGY

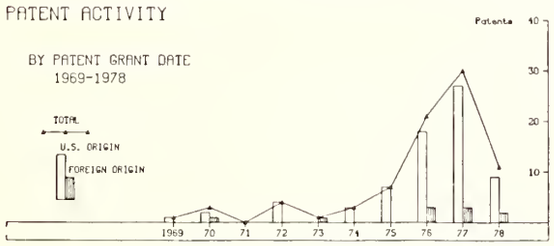
This profile includes systems which utilize thermal energy radiated by the sun to perform useful mechanical work directly. In general, these systems include a thermally expansible or vaporizable working fluid which is heated by solar radiation. The pressurized fluid thus produced is used to drive a fluid motor.

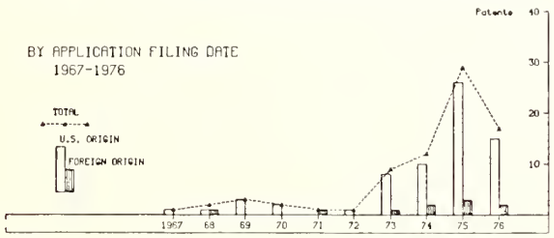
INCLUDED IN THIS PROFILE ARE SELECTED PATENTS FROM:
Class 60, Subclasses 398,641
Class 244, Subclasses 168,173
Class 416, Subclasses 37,41,85
Class 417, Subclasses 52,53,334,379

ACTIVITY INDICES (1976-1978)

GROWTH	76.5%
FOREIGN SHARE	12.9%
CORPORATE OWNED	24.2%
GOVERNMENT OWNED	4.8%
U.S. OWNED OF FOREIGN	0.0%

PATENT ACTIVITY





TECHNOLOGY SCOPE

U.S. PATENT CLASSIFICATION

ACTIVITY INDICES - DEFINED

% GROWTH: The number of patents granted in the period 1976-78 divided by the total number of patents granted in the period 1969-78, multiplied by 100. (Average for all technologies = 28.4%)

% FOREIGN SHARE: The number of patents granted to residents of foreign countries in the years 1976-78, divided by total number of patents granted in these years, multiplied by 100. (Average for all technologies = 37.0%)

% CORPORATE OWNED: The number of 1976-78 patents assigned at time of grant to U.S. or foreign non-government entities -- mainly corporations -- divided by the total number of patents granted in this three year period, multiplied by 100. (Average for all technologies = 76.4%)

% GOVERNMENT OWNED: The number of 1976-78 patents assigned at time of grant to the U.S. Government or a foreign government, divided by total number of patents granted in this three year period, multiplied by 100. (Average for all technologies = 2.6%)

% U.S. OWNED OF FOREIGN: The number of 1976-78 patents with a foreign resident inventor assigned at the time of grant to a U.S. organization, divided by the number of patents with a foreign resident inventor in these years, multiplied by 100. (Average for all technologies = 8.5%)

The information on this page can be interpreted as indicative of trends in the direction and rate of growth of the subject technology.

---

* U.S. Patents only

**See further explanation in Appendix A.

PART 2A

Part 2A of each profile shows in tabular form the data relied upon in constructing the graphical illustrations in Part 1. The first table shows the yearly distribution of patents by the date of the patent grant, while the second table redistributes this data based on the application filing date of the patents. The usefulness of this latter data distribution is mentioned in the explanation of Part 1, and further detailed in Appendix A.

EXAMPLE

SOLAR ENERGY - DIRECT CONVERSION OF SOLAR ENERGY TO MECHANICAL ENERGY

PATENT ACTIVITY (1963-1978) BY DATE OF PATENT GRANT

	NUMBER OF PATENTS									
	63-64	1965	1966	1967	1968	1969	1970	1971	1972	1973
TOTAL	7	4	4	2	1	1	3		4	1
U.S. ORIGIN	7	4	4	2	1	1	2		4	
FOREIGN ORIGIN							1			1
CANADA							1			1
ITALY										
FRANCE										
GERMANY										
JAPAN										
AUSTRALIA										
U.S. ORIGIN	7	4	4	2	1	1	2		4	
U.S. CORP. OWNED	2	3	3						1	
U.S. GOVT OWNED	1			1					1	
U.S. INDIV. OWNED	4	1	1	1	1	1	2		2	
FOREIGN OWNED										
FOREIGN ORIGIN							1			1
U.S. OWNED										
FOREIGN OWNED							1			1
FOREIGN CORP										

PART 2B

Part 2B of each profile provides a list of assignees* ranked by the number of patents, in the technology, to which they held title at the time of the patent grant. In some instances, the listing is limited by designation of a "cut-off" (e.g., "2 or more patents"). The time period covered is 1969-1978. This list identifies those assignees, mostly corporations, which received the most patents in the technology encompassed by the profile during the subject time period, and shows the comparative relationship of their activity to that of the other participants in the field.

EXAMPLE

DIRECT CONVERSION OF SOLAR ENERGY TO ELECTRICAL ENERGY

ASSIGNEES WITH 2 OR MORE PATENTS (1/69 - 12/78)

UNITED STATES OF AMERICA, NATIONAL AERONAUTICS AND SPACE ADM	43
TRW INC.	17
COMMUNICATIONS SATELLITE CORP.	15
HUGHES AIRCRAFT COMPANY	14
WESTINGHOUSE ELECTRIC CORP.	13
UNITED STATES OF AMERICA, NAVY	11
RCA CORPORATION	11
OPTEL CORPORATION	10
U.S. PHILIPS CORPORATION	9
LICENTIA PATENT-VERWALTUNGS-GMBH	9
BELL TELEPHONE LABORATORIES INCORPORATED	9
MOBIL TYCO SOLAR ENERGY CORP.	8
UNITED STATES OF AMERICA, AIR FORCE	7
TEXAS INSTRUMENTS, INCORPORATED	7
SOLAREX CORPORATION	6
MASSACHUSETTS INSTITUTE OF TECHNOLOGY	6
UNITED STATES OF AMERICA, DEPARTMENT OF ENERGY	6
UNITED STATES OF AMERICA, ARMY	5
SOCIETE ANONYME DE TELECOMMUNICATIONS	5
AMERICAN CYANAMID COMPANY	4
INTERNATIONAL BUSINESS MACHINES CORPORATION	4
GLOBE-UNION INC.	4
MOTOROLA INC	4

---

*See definition in Appendix A.

PART 2C

Part 2C of each profile also covers assigned patenting during the period 1969-1978. Assignees are listed alphabetically followed by a numerical listing of patents to which they held title at the time of patent grant.

This section provides valuable information to potential entrepreneurs, competitors and those in need of technological know-how by identifying corporate actors in the field. Inclusion of patent titles further defines the subject technology arena.

EXAMPLE

```
SOLAR ENERGY - DIRECT CONVERSION OF SOLAR ENERGY TO MECHANICAL ENERGY

                    ASSIGNED PATENTING(1/69 - 12/78) - - ALPHA LISTING

AAI CORPORATION
  3994435  -  SOLAR ENERGY CONCENTRATING AND COLLECTING ARRANGEMENT AND ME
  4004574  -  SOLAR ENERGY CONCENTRATING AND COLLECTING ARRANGEMENT WITH SU
              O

AGENCE NATIONALE DE VALORISATION DE LA RECHERCHE ANVAR
  3937599  -  PUMPING SYSTEM USING SOLAR ENERGY

AGENCE NATIONALE DE VALORISATION DE LA RECHERE (ANVAR)
  4010732  -  MULTI-STAGE SYSTEM FOR ACCUMULATION OF HEAT FROM SOLAR RADIAT

BILLI S.P.A.
  3938355  -  METHOD OF KNITTING A PLURALITY OF CONVERGENT TUBULAR PORTIONS

BROWN; ANDREW GRAHAM
  4068476  -  SOLAR DRIVEN POWER UNIT

CREATIVE ENTERPRISES INTERNATIONAL
  3659960  -  TRANSMISSION OF FLUIDS THROUGH A PIPELINE

FABBRICA ITALIANA MAGNETI MARELLI S.P.A.
  4118638  -  SYSTEM OF DISTRIBUTING PILOT SIGNALS

GULF OIL CORPORATION
  3868823  -  CONCENTRATOR, METHOD, AND SYSTEM FOR UTILIZING RADIANT ENERGY

KAY LABORATORIES, INC.
```

PART 2D

Part 2D of each profile presents an alphabetical listing of inventors of unassigned patents (1975 to 1978) together with their addresses, the patent numbers and titles. This information facilitates identification of the apparently unaffiliated or "independent inventor" participants in the technology. Standard, two character codes are used to designate U.S. states and foreign countries. While the meaning of state codes should be obvious, the foreign country codes may not. Consequently, those appearing in the Part 2D listing are given in Appendix A.

EXAMPLE

```
SOLAR ENERGY - DIRECT CONVERSION OF SOLAR ENERGY TO MECHANICAL ENERGY                                  PAGE 0    1

                          UNASSIGNED PATENTS (1/75-12-78) INVENTORS (ALPHA LISTING)

 INVENTOR NAME                                    STREET                        CITY                  ST    ZIP/CNTRY

 ARTHUR          DAVID        M.                  4020 N. 14TH AVE.             PHOENIX               AZ      85013
4010614  -  SOLAR RADIATION COLLECTOR AND SYSTEM FOR CONVERTING AND STORING COLLECTED SOLAR ENERGY

 BRINJEVEC       HEINZ        J.                  3990 RIBEROY ROAD             WINDSOR, ONTARIO              CA
4047385  -  SOLAR TO ELECTRICAL ENERGY CONVERTING SYSTEM

 BRYCE           NORMAN       K.                  P.O. BOX 685                  PIMA                  AZ      85543
3999389  -  SOLAR ENERGY CONVERTER

 BURNETT         JAMES        T.                  RIVER BANK ROAD               BATESVILLE            AR      72501
4031702  -  MEANS FOR ACTIVATING HYDRAULIC MOTORS
```

At the end of Part 2D is a list of those patents (1963-1978) with neither assignment nor inventor information in the data base. Essentially, this encompasses all patenting in the period 1963-1968, and non-assigned ("independent inventor") patenting from 1969 through 1974. Titles are included for most patents granted subsequent to Jan. 1969.

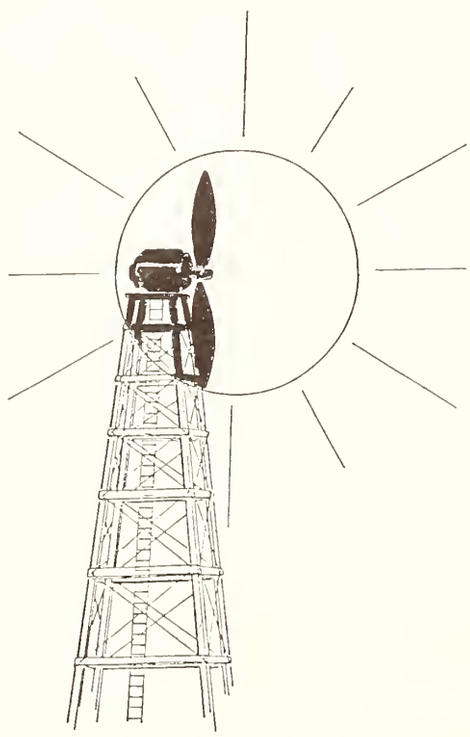
```
                    PATENTS (1/63-12/78) WITH NEITHER ASSIGNMENT NOR INVENTOR INFORMATION IN DATABASE

3436908  -  SOLAR AIR MOVING SYSTEM
3490996  -  SOLAR HEATED WATER VAPOR LIFTING AND CONDENSING SYSTEM
3509716  -  SOLAR ENERGY THERMODYNAMIC MOTOR
3514942  -  SOLAR HEAT TRANSDUCER APPARATUS
3654759  -  APPARATUS FOR CONVERTING SOLAR ENERGY TO LOW COST POWER
3680307  -  HEAT ENERGY TRANSFER DEVICE
3752395  -  WIND MOTOR OPERATED HEATING SYSTEM
3822692  -  CONTROLLED SOLAR ENERGIZED POWER GENERATOR
3832853  -  WIND AND SOLAR ENERGY CONVERSION SYSTEM FOR MULTI-STORY BUILDINGS
3841738  -  CURVED PAPER PANEL REFLECTIVE STRUCTURE
        3089670   3097480   3112862   3121265   3137125   3152260   3152442   3203167   3213284   3213285   3216199   3234738
        3279527   3282327   3287901   3309012   3348374   3364676         0         0         0         0         0         0
```

PART 3

Part 3 of each profile updates the preceding material by listing patent numbers, assignee or inventor, and title for those patents which issued from January to October, 1979.

PATENTS INCLUDED IN THE PROFILES

Patent activity profiles are generated by first identifying key Patent and Trademark Office classifications, i.e., those entirely or substantially pertinent to the technology of interest.* All the patents in these classifications are included in the profile. This procedure results, in most cases, with the inclusion of the majority of patents relevant to the technology and few non-relevant patents. However, in a collection as large and as varied as the patent file one can never be sure of the absolute completeness or "purity" of any subset. Consequently, the totality of patents covered in a profile should not be considered to be inclusive of all relevant patents, nor exclusive of all non-relevant patents.



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*For this solar energy PATENT PROFILES, many classifications were identified which were only partially pertinent. Isolation of the solar energy patents in these classifications required a manual, patent-by-patent review. In Part 1 of each profile, such classifications (if any) are separately listed.

SOLAR ENERGY USE

This profile summarizes the data in Parts 1, 2A and 2B of the groups: Solar Heaters, Space Heating and Cooling Systems; Solar Distillation and Evaporation Concentration; Direct Conversion of Solar Energy to Electrical Energy; Direct Conversion of Solar Energy to Mechanical Energy; and Solar Collectors and Concentrators. The individual profiles follow this summary. To avoid duplication, the information normally presented as Parts 2C, 2D and 3 may be found in the individual profiles.

ACTIVITY INDICES (1976-1978)

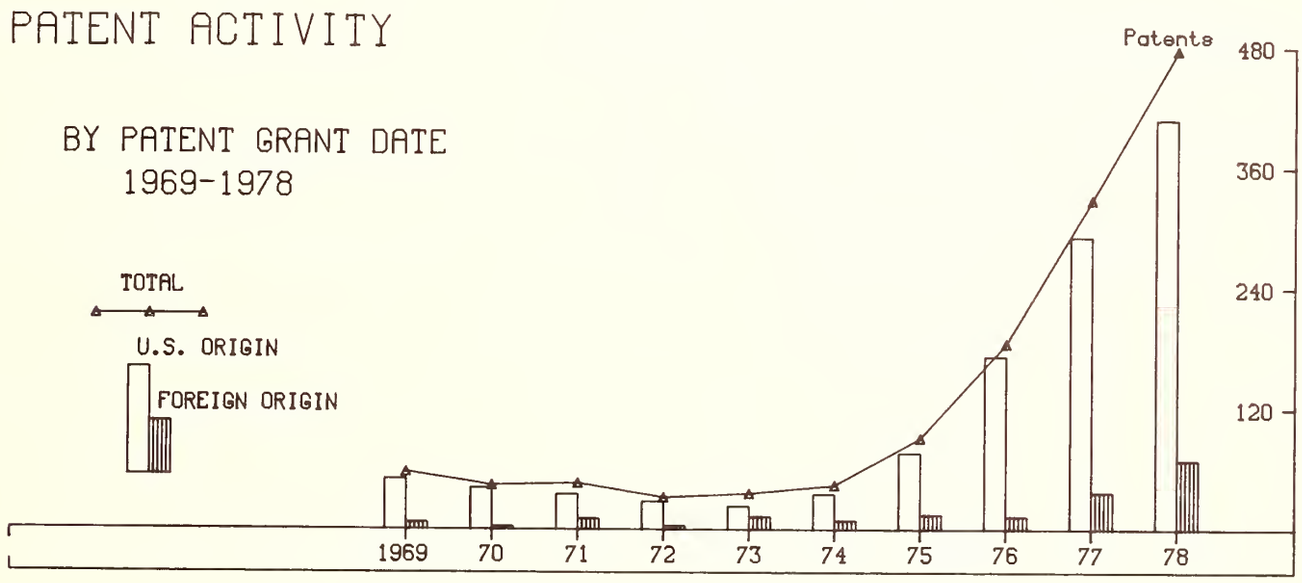
GROWTH	73.9%
FOREIGN SHARE	12.0%
CORPORATE OWNED	46.4%
GOVERNMENT OWNED	5.6%
U.S. OWNED OF FOREIGN	10.1%

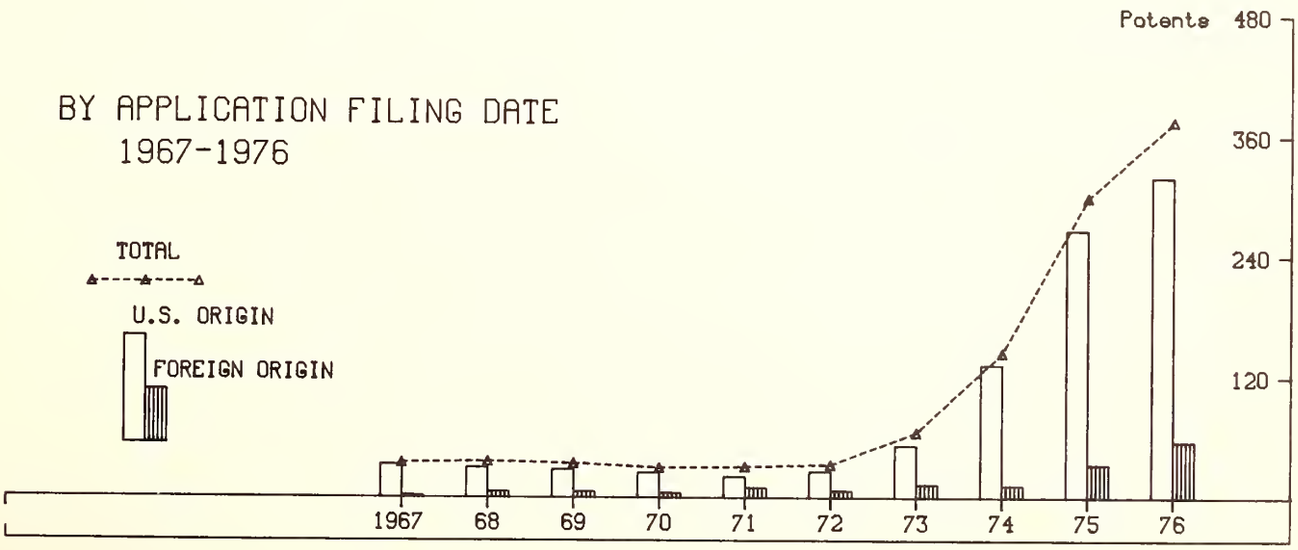
INCLUDED IN THIS PROFILE ARE ALL OF THE PATENTS FROM THE FOLLOWING CLASS/SUBCLASSES:

23/295S; 34/93; 62/2; 126/270,271; 128/372; 136/206; 159/1SF,1S; 203/Dig 1; 237/1A; 353/3; 429/111

AND SELECTED PATENTS FROM THE FOLLOWING CLASS/SUBCLASSES:

29/572; 60/398,641,698; 136/89; 165/18,48,64; 202/234; 237/1R,11; 244/58,168,173; 250/211J, 212,215; 310/306,307;320/2,3,5,9,14,15,23, 30,35,39,40,DIG 1; 322/2R, 2A; 350/211, 288-290, 292-296, 299, 300; 357/2,29,30,59; 416/37,41,85; 417/52,53,334,379





SOLAR ENERGY - SOLAR ENERGY USE

PATENT ACTIVITY (1963-1978) BY DATE OF PATENT GRANT

	NUMBER OF PATENTS															
	63-64	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	TOTAL
TOTAL	75	51	74	54	63	57	44	46	32	36	44	91	185	328	477	1657
U.S. ORIGIN	68	47	66	47	55	50	41	35	28	23	35	76	172	291	408	1442
FOREIGN ORIGIN	7	4	8	7	8	7	3	11	4	13	9	15	13	37	69	215
GERMANY	1		1	1	2		1	3	2	5	2	6	2	6	12	44
FRANCE		1	2	2	2	2		3		2	3	5	1	2	12	37
JAPAN			1	1	1	1	1	2		2	1	1	2	6	5	24
CANADA		1	1	1			1		1	1	1	1	1	4	6	19
SWITZERLAND	1		1						1		1		1	3	9	17
UNITED KINGDOM	1	1	1	1				2				2		2	4	14
AUSTRALIA													2	3	5	10
ISRAEL	1				1									1	5	8
NETHERLANDS			1			1		1		2	1				1	7
SWEDEN													1	3	2	6
NEW ZEALAND														2	2	4
ITALY						1							2		1	4
SOUTH AFRICA	1													1	1	3
SPAIN		1				1							1			3
U.S.S.R.						1				1						2
CHINA(TAIWAN)														1	1	2
NIGERIA															1	1
ARGENTINA															1	1
MOROCCO	1															1
WEST INDIES				1												1
NORWAY					1											1
CHANNEL ISLANDS														1		1
SAUDI ARABIA	1															1
LIECHTENSTEIN														1		1
DENMARK														1		1
INDIA															1	1
INDONESIA					1											1
U.S. ORIGIN	68	47	66	47	55	50	41	35	28	23	35	76	172	291	408	1442
U.S. CORP. OWNED	35	28	39	17	28	25	27	16	12	12	19	34	79	127	185	683
U.S. GOVT. OWNED	6	3	5	5	10	11	7	10	7	7	4	8	17	13	20	133
U.S. INDIV. OWNED	27	16	22	25	16	14	7	9	9	4	12	34	76	151	202	624
FOREIGN OWNED					1										1	2
FOREIGN ORIGIN	7	4	8	7	8	7	3	11	4	13	9	15	13	37	69	215
U.S. OWNED			3		1	1		2	1	1	4	1	1	4	7	26
FOREIGN OWNED	7	4	5	7	7	6	3	9	3	12	5	14	12	33	62	189
FOREIGN CORP.	1	1	1	4	2	3	2	7		11	4	9	9	17	30	101
FOREIGN GOVT.	1													2	2	5
FOREIGN INDIV.	5	3	4	3	5	3	1	2	3	1	1	5	3	14	30	83

SOLAR ENERGY - SOLAR ENERGY USE

PATENT ACTIVITY (PATENTS GRANTED 1/67-12/78) BY DATE OF PATENT APPLICATION

	NUMBER OF PATENTED APPLICATIONS															
	PRE 65	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	TOTAL
TOTAL	71	47	57	35	36	34	30	31	33	65	144	299	375	188	12	1457
U.S. ORIGIN	63	38	49	33	30	28	25	21	26	52	132	266	319	167	12	1261
FOREIGN ORIGIN	8	9	8	2	6	6	5	10	7	13	12	33	56	21		196
GERMANY	1	1	1	1	2	4	1	3	4	5		5	10	4		42
FRANCE	2	5			1		1	3	2	3	3	2	9	3		34
JAPAN	1		3	1		1	1	2			2	5	5	2		23
CANADA		1			1		1	1		1	1	4	5	2		17
SWITZERLAND							1			1	1	2	6	4		15
UNITED KINGDOM	1				1	1				1	1	2	3	1		11
AUSTRALIA											3	3	4			10
ISRAEL		1											3	3		7
NETHERLANDS			2		1				1	1			1			6
SWEDEN											1	1	3	1		6
NEW ZEALAND												3	1			4
ITALY			1							1		1	1			4
SOUTH AFRICA												1	1			2
SPAIN			1									1				2
U.S.S.R.		1						1								2
CHINA(TAIWAN)													2			2
NIGERIA												1				1
ARGENTINA													1			1
MOROCCO																
WEST INDIES	1															1
NORWAY	1															1
CHANNEL ISLANDS												1				1
SAUDI ARABIA																
LIECHTENSTEIN													1			1
DENMARK												1				1
INDIA														1		1
INDONESIA	1															1
U.S. ORIGIN	63	38	49	33	30	28	25	21	26	52	132	266	319	167	12	1261
U.S. CORP. OWNED	36	12	29	17	17	15	9	12	13	21	55	114	144	79	8	581
U.S. GOVT. OWNED	7	5	12	7	5	7	8	3	7	5	11	16	14	11	1	119
U.S. INDIV. OWNED	20	21	7	9	8	6	8	6	6	26	66	136	160	77	3	559
FOREIGN OWNED			1										1			2
FOREIGN ORIGIN	8	9	8	2	6	6	5	10	7	13	12	33	56	21		196
U.S. OWNED	1		2		2	1			1	4		3	3	6		23
FOREIGN OWNED	7	9	6	2	4	5	5	10	6	9	12	30	53	15		173
FOREIGN CORP.	4	4	4	1	2	3	3	9	5	7	7	14	27	8		98
FOREIGN GOVT.												2	2			4
FOREIGN INDIV.	3	5	2	1	2	2	2	1	1	2	5	14	24	7		71

SOLAR ENERGY USE

ASSIGNEES WITH 4 OR MORE PATENTS (1/69 - 12/78)

UNITED STATES OF AMERICA, NATIONAL AERONAUTICS AND SPACE ADM	55*
UNITED STATES OF AMERICA, DEPARTMENT OF ENERGY	22
TRW INC.	19
UOP INC.	19
WESTINGHOUSE ELECTRIC CORP.	17
HUGHES AIRCRAFT COMPANY	17
UNITED STATES OF AMERICA, NAVY	14
RCA CORPORATION	13
COMMUNICATIONS SATELLITE CORP.	12
OWENS-ILLINOIS INC.	12
PPG INDUSTRIES INC.	11
U.S. PHILIPS CORPORATION	10
OPTEL CORPORATION	10
BELL TELEPHONE LABORATORIES INCORPORATED	9
LICENTIA PATENT-VERWALTUNGS-GMBH	9
HALM INSTRUMENT CO. INC.	9
MOBIL TYCO SOLAR ENERGY CORP.	8
RAYTHEON COMPANY	8*
MOTOROLA INC.	7
MASSACHUSETTS INSTITUTE OF TECHNOLOGY	7
BATTELLE DEVELOPMENT CORPORATION	6
GREAT SALT LAKE MINERALS AND CHEMICALS CORPORATION	6
BOEING COMPANY	6
SUNWORKS, INC.	6
INTERNATIONAL SOLARTHERMICS CORPORATION	6
OLIN CORPORATION	6
AMERICAN CYANAMID COMPANY	5
UNITED STATES OF AMERICA, AIR FORCE	5
VARIAN ASSOCIATES, INC.	5
ITEK CORPORATION	5
SOCIETE ANONYME DE TELECOMMUNICATIONS	5
UNITED STATES OF AMERICA, ARMY	5
DOW CORNING CORPORATION	5
GRUMMAN AEROSPACE CORPORATION	5
AGENCE NATIONALE DE VALORISATION DE LA RECHERCHE ANVAR	5*
TEXAS INSTRUMENTS, INCORPORATED	4
EXXON RESEARCH + ENGINEERING CO.	4
COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANIZATION	4
SCIENTIFIC-ATLANTA, INC.	4
HOECHST AKTIENGESELLSCHAFT	4
GLOBE-UNION, INC.	4
SOLAREX CORPORATION	4
ROCKWELL INTERNATIONAL CORPORATION	4
ALLIED CHEMICAL CORPORATION	4
FAFCO INCORPORATED	4
AAI CORPORATION	4

*COMPOSITE TOTAL, SEE APPENDIX A

SOLAR HEATERS, AND SPACE HEATING AND COOLING SYSTEMS

This profile includes heating apparatus using solar thermal radiation, such as cooking stoves, household water heaters, swimming pool heaters, and systems utilizing solar thermal energy for space heating and/or cooling, primarily for buildings. The heating systems involve the use of solar energy to heat a fluid. The heated fluid may be circulated throughout an enclosed space, or the heat of the fluid may be transferred to a storage reservoir and circulated as needed. The solar powered cooling systems use solar energy as the heat source in a gas absorption refrigeration system.

INCLUDED IN THIS PROFILE ARE ALL OF THE PATENTS FROM:

- Class 34, Subclass 93
- Class 62, Subclass 2
- Class 126, Subclasses 270,271
- Class 237, Subclass 1A
- Class 128, Subclass 372

AND SELECTED PATENTS FROM:

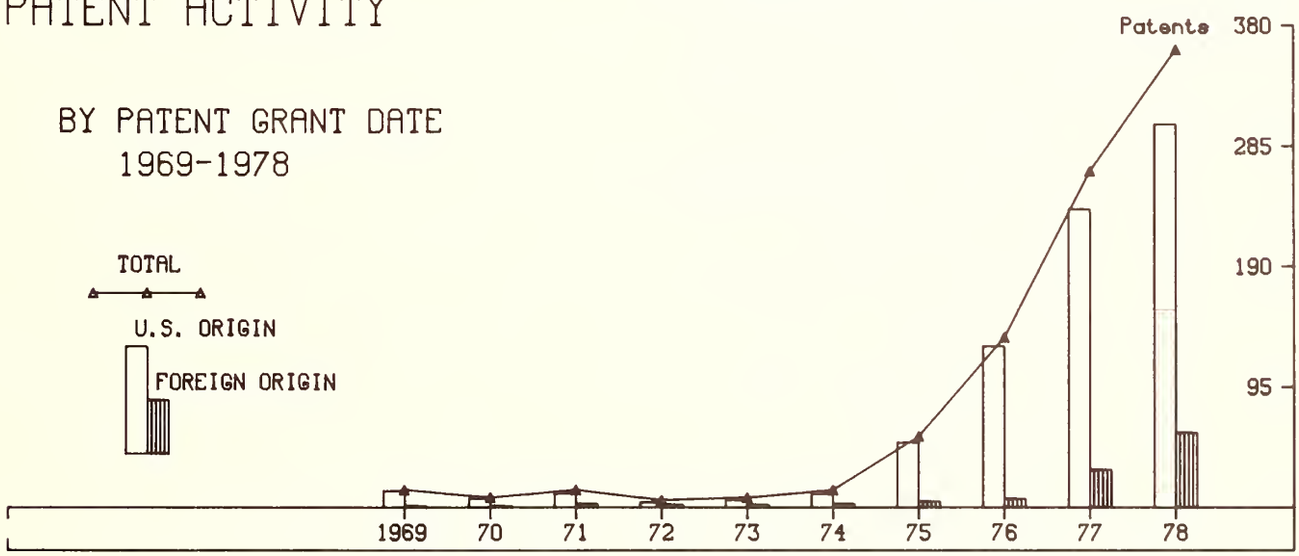
- Class 165, Subclasses 18, 48, 64
- Class 237, Subclasses 1R, 11

ACTIVITY INDICES (1976-1978)

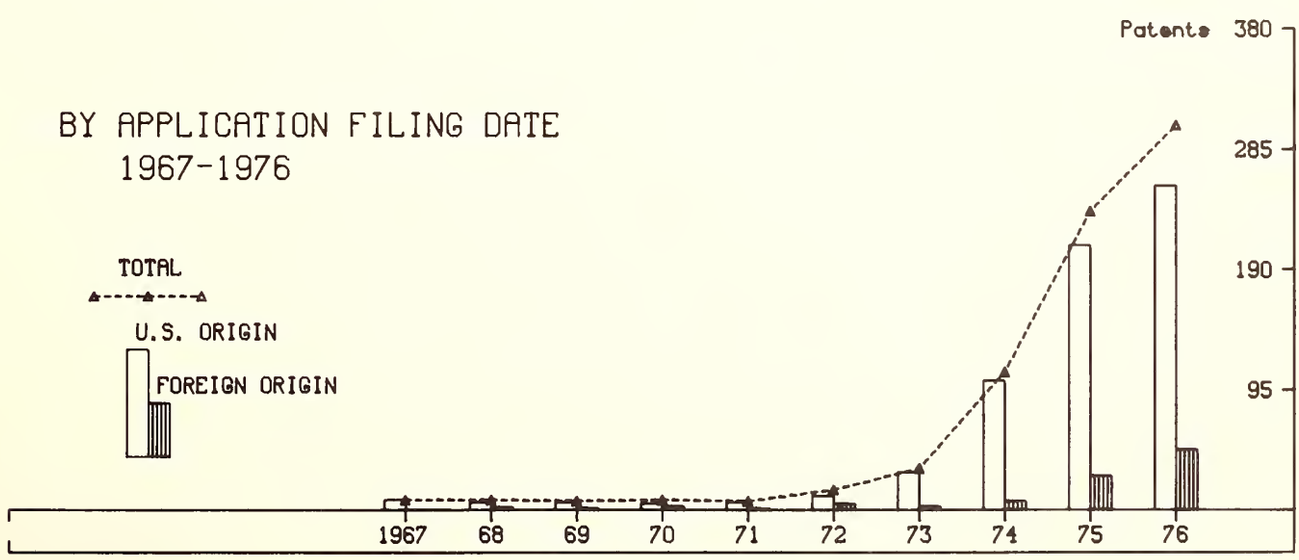
GROWTH	86.4%
FOREIGN SHARE	12.6%
CORPORATE OWNED	40.7%
GOVERNMENT OWNED	4.6%
U.S. OWNED OF FOREIGN	7.3%

PATENT ACTIVITY

BY PATENT GRANT DATE
1969-1978



BY APPLICATION FILING DATE
1967-1976



SOLAR ENERGY - SOLAR HEATERS. AND SPACE HEATING AND COOLING SYSTEMS

PATENT ACTIVITY (1963-1978) BY DATE OF PATENT GRANT

	NUMBER OF PATENTS															
	63-64	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	TOTAL
TOTAL	39	27	40	17	19	14	8	14	6	8	14	56	134	265	361	1022
U.S. ORIGIN	34	25	35	13	17	13	7	11	4	6	11	51	127	235	302	891
FOREIGN ORIGIN	5	2	5	4	2	1	1	3	2	2	3	5	7	30	59	131
GERMANY	1		1		1							3	1	4	9	20
CANADA			1	1			1		1		1		1	4	6	16
FRANCE				2				1			1			2	10	16
SWITZERLAND	1		1						1		1		1	2	9	16
JAPAN			1	1				1				1		4	2	10
AUSTRALIA													2	3	5	10
UNITED KINGDOM		1	1					1				1		1	4	9
ISRAEL	1				1										5	7
SWEDEN														3	2	5
NEW ZEALAND														2	2	4
SOUTH AFRICA	1													1	1	3
SPAIN		1											1			2
NETHERLANDS										1					1	2
ITALY						1							1			2
NIGERIA															1	1
ARGENTINA															1	1
CHANNEL ISLANDS														1		1
CHINA(TAIWAN)														1		1
MOROCCO	1															1
U.S.S.R.										1						1
INDIA															1	1
LIECHTENSTEIN														1		1
DENMARK														1		1
U.S. ORIGIN	34	25	35	13	17	13	7	11	4	6	11	51	127	235	302	891
U.S. CORP. OWNED	15	13	16	1	4	4	3	1		3	1	20	52	95	116	344
U.S. GOVT. OWNED	1		2	1	2	1	1	3	1	1	2	3	10	12	8	48
U.S. INDIV. OWNED	18	12	17	11	10	8	3	7	3	2	8	28	65	128	177	497
FOREIGN OWNED					1										1	2
FOREIGN ORIGIN	5	2	5	4	2	1	1	3	2	2	3	5	7	30	59	131
U.S. OWNED											1			3	4	8
FOREIGN OWNED	5	2	5	4	2	1	1	3	2	2	2	5	7	27	55	123
FOREIGN CORP.	1	1	1	3				1		2	1	2	4	11	24	51
FOREIGN GOVT.	1													2	2	5
FOREIGN INDIV.	3	1	4	1	2	1	1	2	2		1	3	3	14	29	67

SOLAR ENERGY - SOLAR HEATERS, AND SPACE HEATING AND COOLING SYSTEMS

PATENT ACTIVITY (PATENTS GRANTED 1/67-12/78) BY DATE OF PATENT APPLICATION

	NUMBER OF PATENTED APPLICATIONS															
	PRE 65	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	TOTAL
TOTAL	13	16	16	8	8	7	8	7	16	33	109	236	304	131	4	916
U.S. ORIGIN	11	12	15	8	6	6	5	6	11	30	102	209	256	116	4	797
FOREIGN ORIGIN	2	4	1		2	1	3	1	5	3	7	27	48	15		119
GERMANY		1							3	1		3	8	2		18
CANADA		1			1		1			1		4	5	2		15
FRANCE	1	1					1		1			2	8	2		16
SWITZERLAND							1			1	1	2	5	4		14
JAPAN	1					1					2	2	3			9
AUSTRALIA											3	3	4			10
UNITED KINGDOM					1						1	1	3	1		7
ISRAEL		1											3	2		6
SWEDEN												1	3	1		5
NEW ZEALAND												3	1			4
SOUTH AFRICA												1	1			2
SPAIN												1				1
NETHERLANDS									1				1			2
ITALY			1									1				2
NIGERIA												1				1
ARGENTINA													1			1
CHANNEL ISLANDS												1				1
CHINA(TAIWAN)													1			1
MOROCCO																
U.S.S.R.								1								1
INDIA														1		1
LIECHTENSTEIN													1			1
DENMARK												1				1
U.S. ORIGIN	11	12	15	8	6	6	5	6	11	30	102	209	256	116	4	797
U.S. CORP. OWNED	1		6	3	2	1		2	4	9	42	82	101	46	1	300
U.S. GOVT. OWNED	2		3		1	1	2		3	1	5	13	9	5		45
U.S. INDIV. OWNED	8	12	5	5	3	4	3	4	4	20	55	114	145	65	3	450
FOREIGN OWNED			1										1			2
FOREIGN ORIGIN	2	4	1		2	1	3	1	5	3	7	27	48	15		119
U.S. OWNED										1		2	2	3		8
FOREIGN OWNED	2	4	1		2	1	3	1	5	2	7	25	46	12		111
FOREIGN CORP.	2	1					1	1	4		4	9	21	5		48
FOREIGN GOVT.												2	2			4
FOREIGN INDIV.		3	1		2	1	2		1	2	3	14	23	7		59

SOLAR HEATERS, AND SPACE HEATING AND COOLING SYSTEMS

ASSIGNEES WITH 3 OR MORE PATENTS (1/69 - 12/78)

UNITED STATES OF AMERICA, DEPARTMENT OF ENERGY	20
UNITED STATES OF AMERICA, NATIONAL AERONAUTICS AND SPACE ADM	14
UOP INC.	14
OWENS-ILLINOIS INC.	12
PPG INDUSTRIES INC.	11
HALM INSTRUMENT CO. INC.	9
OLIN CORPORATION	6
INTERNATIONAL SOLARTHERMICS CORPORATION	6
SUNWORKS, INC.	6
BATTELLE DEVELOPMENT CORPORATION	5
RAYTHEON COMPANY	5*
AAI CORPORATION	4
MOTOROLA INC.	4
COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANIZATION	4
UNITED STATES OF AMERICA, NAVY	4
FAFCO INCORPORATED	4
HOECHST AKTIENGESELLSCHAFT	4
SCIENTIFIC-ATLANTA, INC.	4
GRUMMAN AEROSPACE CORPORATION	4
ITEK CORPORATION	4
AGENCE NATIONALE DE VALORISATION DE LA RECHERCHE ANVAR	4*
DOW CORNING CORPORATION	3
GAS DEVELOPMENTS CORPORATION	3
AMERICAN CYANAMID COMPANY	3
U.S. PHILIPS CORPORATION	3
HUGHES AIRCRAFT COMPANY	3
BORG-WARNER CORPORATION	3
SANDERS ASSOCIATES INC.	3
RCA CORPORATION	3
ROBERTSHAW CONTROLS COMPANY	3
UNITED STATES OF AMERICA, INTERIOR	3
RAYMOND LEE ORGANIZATION, INC.	3
LOWE, JAMES L.	3
WESTINGHOUSE ELECTRIC CORP.	3

*COMPOSITE TOTAL, SEE APPENDIX A

ASSIGNEO PATENTING(1/69 - 12/78) - - ALPHA LISTING

AAI CORPORATION
3994435 - SOLAR ENERGY CONCENTRATING AND COLLECTING ARRANGEMENT ANO METHOD
4004574 - SOLAR ENERGY CONCENTRATING ANO COLLECTING ARRANGEMENT WITH SUN-FOLLOWER ANO SOLAR ENERGY SENSING POWER CONTROL ANO METHO O
4018211 - SOLAR ENERGY COLLECTION ANO TRANSFER ARRANGEMENT ANO METHOD, AND METHOD OF ASSEMBLY
4111360 - SOLAR ENERGY CONCENTRATING ANO COLLECTING ARRANGEMENT ANO METHOO

AB SVENSKA FLAKTFABRIKEN
4006856 - ARRANGEMENT FOR UTILIZING SOLAR ENERGY FOR HEATING BUILDINGS

ACME ENGINEERING AND MANUFACTURING CORPORATION
4061131 - HEAT TRANSFER SYSTEM PARTICULARLY APPLICABLE TO SOLAR HEATING INSTALLATIONS

AGENCE NATIONALE OE VALORISATION OE LA RECHERCHE ANVAR
3832992 - NATURALLY AIR-CONDITIONEO OWELLINGS
4111359 - OWELLINGS EQUIPPED WITH NATURAL AIRCONDITIONING INSTALLATIONS
4129360 - HELIOSTATS

AGENCE NATIONALE DE VALORISATION OE LA RECHERE (ANVAR)
4010732 - MULTI-STAGE SYSTEM FOR ACCUMULATION OF HEAT FROM SOLAR RAOIANT ENERGY

ALLIED CHEMICAL CORPORATION
4040410 - THERMAL ENERGY STORAGE SYSTEMS EMPLOYING METAL HYDRIOES

ALL SUNPOWER, INC.
4112922 - SOLAR ENERGY COLLECTOR

AMERICAN CYANAMIO COMPANY
3957029 - GREENHOUSE WINOOW FOR SOLAR HEAT ABSORBING SYSTEMS OERIVEO FROM CO/2\ SNO/4\
3987780 - GREENHOUSE WINOOW FOR SOLAR HEAT ABSORBING SYSTEMS DERIVEO FROM CO/2\ SNO/4
3987781 - GREENHOUSE WINOOW FOR SOLAR HEAT ABSORBING SYSTEMS OERIVEO FROM CO/2\ SNO/4

AMERICAN SOLAR ENERGY CORPORATION
4060072 - SOLAR HEATER APPARATUS

AMETEK, INC.
3958554 - SOLAR COLLECTOR HAVING OXYGEN-OEFICIENT PBO/2 \ COATING
4026271 - SOLAR COLLECTOR COATING

A. O. SMITH CORPORATION
4119087 - SOLAR WATER HEATING SYSTEM

ARKLA-INDUSTRIES, INC.
4028904 - PREHEATER FOR WEAK ABSORBENT

ARMER CONSTRUCTION COMPANY
4106552 - METHOO OF AIR-CONOITIONING EMPLOYING VARIABLE TERMINAL BOX

ARMSTRONG CORK COMPANY
4128095 - SOLAR ENERGY COLLECTOR

ASSIGNED PATENTING(1/69 - 12/78) - - ALPHA LISTING

ATLANTIC FLUIDICS, INC.
4050445 - SOLAR ENERGY COLLECTION SYSTEM

BANSAL; MANJU
4117831 - ENERGY COLLECTOR FOR COLLECTING SOLAR ENERGY AND THE LIKE

BARRY-WEHMILLER COMPANY
4124018 - SOLAR HEAT COLLECTING, STORING AND UTILIZING APPARATUS

BATTELLE DEVELOPMENT CORPORATION
4004571 - ISOMERIZATION FOR PHOTOCHEMICAL SOLAR ENERGY STORAGE
4004572 - SOLAR ENERGY COLLECTION AND RETRIEVAL EMPLOYING REVERSIBLE PHOTOCHEMICAL ISOMERIZATION
4004573 - PROCESS AND APPARATUS FOR SOLAR ENERGY COLLECTION AND RETRIEVAL
4105014 - CATALYTIC EXTRACTION OF STORED SOLAR ENERGY FROM PHOTOCHEMICALS
4117829 - FUR-LIKE PHOTOTHERMAL CONVERTER SURFACE

BATTELLE MEMORIAL INSTITUTE
4083360 - DEVICE FOR COLLECTING SOLAR ENERGY

BEAM ENGINEERING, INC.
3988166 - APPARATUS FOR ENHANCING THE OUTPUT OF PHOTOVOLTAIC SOLAR CELLS

BELL TELEPHONE LABORATORIES INCORPORATED
4089594 - SUN SCREEN STRUCTURE

BIO-GAS CORPORATION
4057401 - METHANE GAS PROCESS AND APPARATUS

BIO GAS OF COLORADO, INC.
3933628 - METHOD AND APPARATUS FOR THE ANAEROBIC DIGESTION OF DECOMPOSABLE ORGANIC MATERIALS

BLOCK ENGINEERING, INC.
3469902 - CATOPTRIC LIGHT COLLECTOR

BOEING COMPANY
3981294 - ALL GLASS COMPOSITE BUILDING PANELS

BOLLEFER; DWIGHT L.
4067314 - SOLAR ENERGY COLLECTOR SYSTEM

BORG-WARNER CORPORATION
4070870 - HEAT PUMP ASSISTED SOLAR POWERED ABSORPTION SYSTEM
4088547 - METHOD FOR PRODUCING A COATED METAL NODULAR SOLAR HEAT COLLECTOR
4100756 - SOLAR POWERED ABSORPTION REFRIGERATION SYSTEM

BOUROON; LEO
4068653 - SOLAR HEATING UNIT

BRITISH PETROLEUM COMPANY LIMITED
4082082 - SOLAR ENERGY COLLECTOR
4129117 - SOLAR ENERGY COLLECTOR

ASSIGNED PATENTING(1/69 - 12/78) - - ALPHA LISTING

BROWN; ANDREW GRAHAM
4068476 - SOLAR DRIVEN POWER UNIT

BROWN, BOVERI + CIE AKTIENGESELLSCHAFT
4062349 - METHOD FOR THE CONTROLLED HEATING OF A LIQUID RESERVOIR, AND RESERVOIR SYSTEM FOR CARRYING OUT THE METHOD

BROWN MANUFACTURING COMPANY
3917942 - SUN TRACKING CONTROL APPARATUS

BROYLES BROYLES, INC.
3894528 - SOLAR ENERGY COLLECTION METHOD AND APPARATUS

BURKE INDUSTRIES, INC.
3991742 - SOLAR ENERGY HEAT TRANSFER SYSTEM

CALMAC MANUFACTURING CORPORATION
4112921 - METHOD AND SYSTEM FOR UTILIZING A FLEXIBLE TUBING SOLAR COLLECTOR

CARRIER CORPORATION
4100755 - ABSORPTION REFRIGERATION SYSTEM UTILIZING SOLAR ENERGY

CARYL, COLEMAN R. D/B/A
3521966 - DEVICE FOR TESTING A SAMPLE WITH SOLAR RADIATION INCLUDING MEANS TO DAMPEN THE SAMPLE
3521967 - MIRROR PROTECTOR MEANS FOR SOLAR RADIATION TESTING MACHINES

CATERPILLAR TRACTOR CO.
3984881 - SOLAR PANEL
3984882 - PANEL STRUCTURE FOR USE ON WATER BODIES

CENTER FOR THE ENVIRONMENT + MAN
4056090 - SOLAR HEAT COLLECTOR
4056094 - SOLAR HEAT COLLECTOR

CENTRE NATIONAL D ETUDES SPATIALES
4122239 - SOLAR ABSORBERS WITH LAYERS OF NICKEL/CHROMIUM ALLOY AND DIELECTRIC MATERIAL

CIBA-GEIGY CORPORATION
4063546 - HEAT STORE AND INSTALLATION FOR THE UTILIZATION OF SOLAR ENERGY

CITIES SERVICE COMPANY
4111189 - COMBINED SOLAR RADIATION COLLECTOR AND THERMAL ENERGY STORAGE DEVICE

CLIMA WALL LTD.
3955555 - AIR AND HEAT CIRCULATION SYSTEM FOR BUILDINGS

COLUMBIA CHASE CORPORATION
4120288 - SOLAR COLLECTOR

COMMISSARIAT A L ENERGIE ATOMIQUE
4031880 - METHOD AND DEVICE FOR COLLECTING SOLAR ENERGY
4108373 - METHOD AND AN INSTALLATION FOR THE AIR-CONDITIONING OF GREENHOUSES AND FRAMES

ASSIGNED PATENTING(1/69 - 12/78) - - ALPHA LISTING

COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANIZATION
3994675 - CHEMICAL STORAGE OF RADIANT ENERGY
4021895 - SOLAR HEATING
4087288 - SOLAR ABSORBER SURFACES
4123219 - CHEMICAL STORAGE OF RADIANT ENERGY

COMPAGNIE POUR L ETUDE ET LA REALISATION DE COMBUSTIBLES A
4095585 - SOLAR ENERGY COLLECTOR WITH ON SITE STORAGE

COOPER; ALLEN K.
4052000 - SOLAR ENERGY AUGMENTED WATER HEATING SYSTEM

CORNING GLASS WORKS
4067315 - SOLAR HEAT PIPE
4116225 - SOLAR ENERGY COLLECTOR

DAYSTAR CORPORATION
4019496 - COLLECTING SOLAR ENERGY
4102325 - TEMPERATURE CONTROL IN SOLAR-TO-THERMAL ENERGY CONVERTERS

DECKS, INCORPORATED
4006731 - BUILDING DECK CONSTRUCTION

DESERT SUNSHINE EXPOSURE TESTS, INC.
4031385 - SOLAR TRACKING DEVICE

DEVELOPMENT FINANCE CORPORATION
4088118 - HEAT EXCHANGER

DIY-SOL, INC.
4060195 - SOLAR HEATING CONTROL SYSTEM
4062346 - SOLAR COLLECTOR UNIT

DOW CHEMICAL COMPANY
3768264 - METHOD FOR SUPPRESSING THE FORMATION OF ICE IN NATURAL OR MAN-MADE BODIES OF WATER
3932997 - METHOD FOR SUPPRESSING THE FORMATION OF ICE IN NATURAL OR MAN-MADE BODIES OF WATER

DOW CORNING CORPORATION
3866285 - METHOD OF CONSTRUCTING A SOLAR ENERGY COLLECTOR
4008708 - SOLAR ENERGY COLLECTOR
4026268 - SOLAR ENERGY COLLECTOR

DUNHAM-BUSH INC.
4086072 - AIR SOURCE HEAT PUMP WITH MULTIPLE SLIDE ROTARY SCREW COMPRESSOR/EXPANDER

ECOSOL, LTD.
4111259 - ENERGY CONSERVATION SYSTEM

ECOTHERMIA, INC.
3884217 - METHOD AND APPARATUS FOR COLLECTING SOLAR ENERGY

ASSIGNED PATENTING(1/69 - 12/78) - - ALPHA LISTING

E. I. DU PONT DE NEMOURS AND COMPANY
4036206 - SELECTIVE SOLAR ENERGY ABSORPTION

EMERSON ELECTRIC CO.
4091799 - SELF-TRACKING RADIANT ENERGY COLLECTOR

ENERCON WEST
4024726 - SOLAR HEAT TRAP FOR BUILDING WINDOWS

ENERGY MATERIALS, INC.
4085999 - TRANSPARENT THERMAL INSULATING SYSTEM

ENERGY SYSTEMS, INC.
3972317 - SOLAR FLUID HEATER
4011856 - SOLAR FLUID HEATER

ENTERPRISE INDUSTRIELLE DE CHAUDRONNERIE
4089325 - SOLAR HEATED BOILER

ENTHONE INCORPORATED.
4074706 - SOLAR COLLECTOR HAVING SELECTIVE FILM OF IMPROVED STABILITY TO LIQUID WATER CONDENSATE

EREVANSKOE OTDELENIE VSESOJUZ-NOGO PROEKTNOISSLEDOVATELSKO-G
3713727 - SOLAR UNIT

E-SYSTEMS, INC.
4069812 - SOLAR CONCENTRATOR AND ENERGY COLLECTION SYSTEM

EXXON RESEARCH + ENGINEERING CO.
4112918 - SOLAR ENERGY COLLECTOR

FAFCO INCORPORATED
3906928 - SOLAR HEATER CONTROL SYSTEM AND METHOD
3934323 - SOLAR HEAT EXCHANGE PANEL AND METHOD OF FABRICATION
4020828 - PRESSURE RELIEF VALVE APPARATUS AND METHOD
4098331 - SOLAR HEAT EXCHANGE PANEL AND METHOD OF FABRICATION

FEDERAL TOOL ENGINEERING COMPANY
3460930 - BACK REFLECTOR FOR RADIANT ENERGY GLASS-TO-METAL SEALING MEANS

FOLDS LARRY J.
3995804 - INVERTED OPEN CHANNEL SOLAR HEAT COLLECTOR PANEL

FRANKLIN INSTITUTE
4114597 - UNITARY SOLAR COLLECTOR

FUN AND FROLIC INCORPORATED
3868945 - SOLAR HEATER FOR SWIMMING POOLS

GAS DEVELOPMENTS CORPORATION
3889742 - AIR CONDITIONING APPARATUS AND METHOD
4081024 - AIR CONDITIONING APPARATUS AND METHOD

ASSIGNED PATENTING(1/69 - 12/78) - - ALPHA LISTING

GAS DEVELOPMENTS CORPORATION (CONTINUED)
4113004 - AIR CONDITIONING PROCESS

GENERAL ATOMIC COMPANY
4071017 - TENSIONED REFLECTOR SUPPORT SYSTEM

GENERAL DYNAMICS CORPORATION
4056309 - RENEWABLE SURFACE HELIOSTAT TYPE SOLAR MIRROR

GENERAL ELECTRIC COMPANY
4124019 - TUBULAR SOLAR COLLECTOR

GENERAL ENERGY DEVICES
4036207 - WATER HEATING ASSEMBLY

GEORGE L. HAYWOOD CO.
4082947 - SOLAR COLLECTOR AND DRIVE CIRCUITRY CONTROL MEANS

GRUMMAN AEROSPACE CORPORATION
4015586 - SOLAR WATER HEATER
4059093 - SOLAR ENERGY COLLECTOR
4086913 - SOLAR HEAT COLLECTOR CONSTRUCTION
4119085 - SOLAR ENERGY COLLECTOR

GULF OIL CORPORATION
3868823 - CONCENTRATOR, METHOD, AND SYSTEM FOR UTILIZING RADIANT ENERGY

HALM INSTRUMENT CO. INC.
3989032 - SOLAR WATER HEATING SYSTEM
4010731 - HEAT STORAGE TANK
4038965 - EVACUATED SOLAR HEAT COLLECTOR
4038966 - SOLAR HEAT COLLECTOR TANK
4051891 - HEAT TRANSFER BLOCK MEANS
4076076 - MECHANICAL HEAT EXCHANGE JOINT
4086909 - AIR-HEATING SOLAR COLLECTOR
4106480 - REFLECTIVE SOLAR HEAT COLLECTOR
4108374 - HEAT STORAGE WATER TANK

HALSTEAD INDUSTRIES, INC.
4064868 - SOLAR HEAT COLLECTOR

HANSEN, LIND, MEYER
4103493 - SOLAR POWER SYSTEM

HARRIGAN; PAUL D.
4020827 - SOLAR ENERGY COLLECTING SYSTEM

H. H. ROBERTSON COMPANY
4020989 - LIGHT TRANSMITTING BUILDING PANEL

HINDERSTEIN PHILIP M.
4052974 - TUBELESS SOLAR COLLECTOR

ASSIGNED PATENTING(1/69 - 12/78) - - ALPHA LISTING

HITACHI CHEMICAL COMPANY, LTD.
4046136 - SOLAR ENERGY COLLECTING DEVICE

HOECHST AKTIENGESELLSCHAFT
3905764 - PROCESS AND DEVICE FOR THE WET TREATMENT AND DRYING OF TEXTILE MATERIAL
3909196 - PROCESS AND DEVICE FOR THE IMPREGNATION AND DRYING OF TEXTILE MATERIAL
4066063 - DEVICE FOR THE TRANSMISSION OF SOLAR ENERGY TO A LIQUID MEDIUM
4116222 - PROCESS AND APPARATUS FOR COLLECTING SOLAR ENERGY

HONEYWELL INC.
4085729 - SOLAR AIR HEATER
4085730 - SOLAR AIR HEATER

HUGHES AIRCRAFT COMPANY
3427808 - LIQUID CONTAINER PRESSURIZATION BY NON- ELECTROLYTIC DISSOCIATION OF CONTAINER CONTENTS
3744478 - THERMAL RADIATION SHIELD
4057963 - HEAT PIPE CAPABLE OF OPERATING AGAINST GRAVITY AND STRUCTURES UTILIZING SAME

IDAHO RESEARCH FOUNDATION, INC.
4120283 - SOLAR HEAT COLLECTOR

IDC CHEMIE AG
4059146 - HEATING SYSTEM WITH A THERMAL PUMP

INSTITUT FUR KERNTECHNIK UND ENERGIEWANDLUNG E.V.
4131158 - STORAGE ARRANGEMENT FOR THERMAL ENERGY

INTERLIZ ANSTALT
4052001 - HEATING SYSTEM

INTERNATIONAL BUSINESS MACHINES CORPORATION
4005698 - PHOTON ENERGY CONVERTER

INTERNATIONAL SOLARTHERMICS CORPORATION
3894685 - SOLAR HEATING SYSTEM
3946720 - SOLAR HEAT COLLECTOR
3946721 - METHOD OF COLLECTING AND STORING SOLAR HEAT
3946944 - METHOD OF HEATING A BUILDING STRUCTURE WITH SOLAR HEAT
4088117 - SOLAR HEAT COLLECTING UNITS
4088266 - METHOD AND APPARATUS FOR COLLECTING, STORING AND TRANSMITTING SOLAR HEAT

INTERNATIONAL TELEPHONE AND TELEGRAPH CORPORATION
4027821 - SOLAR HEATING/COOLING SYSTEM
4100763 - MULTI-SOURCE HEAT PUMP HVAC SYSTEM

IOWA STATE UNIVERSITY RESEARCH FOUNDATION INC.
3863621 - SOLAR WALL SYSTEM

ITEK CORPORATION
3869199 - SOLAR ENERGY ABSORBER
4044754 - SOLAR COLLECTOR AUTOMATIC FREEZE PROTECTION SYSTEM
4046135 - HIGHLY EFFICIENT SOLAR COLLECTOR INCLUDING MEANS FOR PREVENTING COVER PLATE FLUID CONDENSATION

ASSIGNED PATENTING(1/69 - 12/78) - - ALPHA LISTING

ITEK CORPORATION (CONTINUED)
4068361 - SELF-JIGGING METHOD OF FABRICATING SOLAR COLLECTOR HEAT TRAP FROM FLEXIBLE PLASTIC ROLL MATERIAL

JAMES B. PAULL + CO., INC.
4124017 - COLLIMATING SOLAR RADIATION COLLECTOR

JOHNSON CONTROLS, INC.
4034912 - METHOD AND CONTROL ARRANGEMENT FOR A HEATING SYSTEM INCLUDING SOLAR AND FUEL-FIRED HEATING APPARATUS
4083356 - SOLAR ENERGY APPARATUS

JORDAN COLLEGE
4131109 - SOLAR COLLECTOR

KAPTRON, INC.
3985116 - HIGH EFFICIENCY SOLAR PANEL
4078548 - HIGH EFFICIENCY SOLAR PANEL

KAWNEER COMPANY, INC.
4067317 - SOLAR ENERGY COLLECTOR PANEL

KENNECOTT COPPER CORPORATION
3987784 - SOLAR ENERGY ABSORBER PANEL

KUREHA KAGAKU KOGYO KABUSHIKI KAISHA
4011874 - OORNO RAY TRANSMITTING SHEET

LAITRAM CORPORATION
4088121 - SOLAR ENERGY CONCENTRATOR

LAWRENCE PESKA ASSOCIATES, INC.
3943726 - SOLAR COOLING SYSTEM FOR AN AUTOMOBILE
3945059 - SWIMMING POOL WATER HEATING SYSTEM

LIBBEY-OWENS-FORD COMPANY
3537944 - TRANSPARENT HEAT REFLECTING WINDOW HAVING RELATIVELY LOW INTERNAL VISUAL REFLECTION

LOWE; JAMES L.
4058111 - SOLAR COLLECTOR
4073285 - FLUID HANDLING SYSTEM
4108159 - SOLAR COLLECTOR

MAINELINE SALES CO., INC.
4057048 - SOLAR HEAT COLLECTOR

MALZ NOMINEES PTY. LTD.
3996917 - SOLAR HEATING APPARATUS
4089323 - SOLAR TRACKING DEVICE

MARCEL GOLAY
4084574 - HEAT INSULATOR

ASSIGNED PATENTING(1/69 - 12/78) - - ALPHA LISTING

MARTIN-MARIETTA CORPORATION
3892433 - DIRECT SOLAR HYDRO-ELECTRIC INTEGRATED SYSTEM AND CONCENTRATING HELIOSTAT FOR SAME
3927659 - PEAK EFFICIENCY SOLAR ENERGY POWERED BOILER AND SUPERHEATER

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
4050508 - CONTROLLABLE HEAT TRANSMISSION PANELS
4086485 - SOLAR-RADIATION COLLECTION APPARATUS WITH TRACKING CIRCUITRY

MAX-PLANCK-GESELLSCHAFT ZUR FORDERUNG DER WISSENSCHAFTEN E.V
3626706 - CRYOSTAT

MCMIAH CORPORATION
4027437 - INFLATABLE BUILDING

MEGA ANALYTICAL RESEARCH SERVICES, INC.
4106484 - ADJUSTABLE SOLAR CONCENTRATOR

METALLGESELLSCHAFT AKTIENGESELLSCHAFT
4078545 - LOW-LOSS SOLAR HEAT COLLECTORS

MINNESOTA MINING AND MANUFACTURING COMPANY
4108540 - REFRACTOR-REFLECTOR RADIATION CONCENTRATOR

MOBIL TYCO SOLAR ENERGY CORP.
3976508 - TUBULAR SOLAR CELL DEVICES
4045246 - SOLAR CELLS WITH CONCENTRATORS

MOR-FLO INDUSTRIES, INC.
4054981 - HEAT EXCHANGER FOR SOLAR ENERGY

MORSE, JR. WILLIAM D.
3931851 - LIQUID AQUIFER ENERGY STORAGE METHOD

MOTOROLA INC.
4062352 - SOLAR FLUID HEATER
4090495 - SOLAR ENERGY COLLECTOR
4092977 - FLAT PLATE SOLAR COLLECTOR
4131485 - SOLAR ENERGY COLLECTOR AND CONCENTRATOR

MULTIFLUID-ENERGIE, SOCIETE ANONYME
4072141 - PREFABRICATED VENTILATING PANEL INCLUDING HEAT TRANSFER MEANS

NEDERLANDSE CENTRALE ORGANISATIE VOOR TOEGEPAST-NAT-
4105822 - METHOD FOR THE APPLICATION OF A SPECTRAL-SELECTIVE COATING ON A PLATE

NEW YORK INSTITUTE OF TECHNOLOGY
4121428 - SOLAR AIR CONDITIONING METHOD AND APPARATUS

N.V. INTERNATIONALE OCTROOI MAATSCHAPPIJ OCTROPA
4089324 - HEAT TRANSFER ELEMENT

ASSIGNEO PATENTING(1/69 - 12/78) - - ALPHA LISTING

OAK RIOGE SOLAR ENGINEERING, INC.
3964464 - SOLAR RADIATION COLLECTOR AND CONCENTRATOR

OLIN CORPORATION
4066121 - HEAT EXCHANGER WITH HEAOER HAVING IMPROVEO FLUIO OISTRIBUTION
4081026 - HOLLOW ARTICLE
4093024 - HEAT EXCHANGER EXHIBITING IMPROVED FLUID OISTRIBUTION
4099559 - SOLAR ABSORBER PLATE OESIGN
4109711 - HEAT EXCHANGE PANEL
4120351 - HEAT EXCHANGE PANEL WITH IMPROVEO HEAOER

ORGANISATION EUROPEENE OE RECHERCHES SPATIALES
3768754 - LOUVER SYSTEM WITH SANOWICH TYPE BLAOES

OWENS-ILLINOIS INC.
3952724 - SOLAR ENERGY CONVERTER
3960136 - SOLAR ENERGY COLLECTION SYSTEM
4002160 - SOLAR ENERGY COLLECTION SYSTEM
4016860 - TUBULAR SOLAR ENERGY COLLECTION SYSTEM UTILIZING AIR MEOIA
4018215 - LIQUID OPERATEO SOLAR ENERGY COLLECTOR
4033327 - SOLAR ENERGY COLLECTOR MOOULE SYSTEM
4043318 - SOLAR ENERGY COLLECTOR
4048982 - BULB-TYPE SOLAR ENERGY COLLECTOR
4048983 - SOLAR ENERGY COLLECTOR APPARATUS
4084576 - BULB-TYPE SOLAR ENERGY COLLECTOR
4091796 - SOLAR ENERGY COLLECTION APPARATUS
4120285 - MODULAR TUBULAR SOLAR ENERGY COLLECTOR APPARATUS

PERKIN-ELMER CORPORATION
4082413 - SELECTIVE RADIATION ABSORPTION OEVICES FOR PRODUCING HEAT ENERGY

PETERS WALTER TOOD
4050777 - SOLAR ENERGY REFLECTING APPARATUS WITH YIELDABLY BIASEO REFLECTORS
4098262 - HEATING APPARATUS USING SOLAR ENERGY

PPG INDUSTRIES INC.
3974822 - SOLAR HEAT COLLECTOR
3974823 - SOLAR COLLECTOR HAVING MINIMUM EOGE HEAT LOSS
3978272 - COATED ARTICLE FOR SOLAR CONTROL ANO PROCESS FOR ITS PRODUCTION
3981293 - SOLAR HEAT COLLECTOR
3990429 - SOLAR HEAT COLLECTOR HAVING A BREATHER TUBE
3990431 - SOLAR HEAT COLLECTOR HAVING A VAPOR BARRIER SEAL AND METHOO OF MAKING SAME
3995613 - SOLAR HEAT COLLECTOR UNIT
3995614 - SOLAR HEAT COLLECTOR
3999536 - SOLAR ENERGY ABSORBER PLATE HAVING A BREATHER TUBE
4061830 - SELECTIVE SOLAR ENERGY RECEIVER AND METHOO FOR ITS PROOUCTION
4130108 - SOLAR COLLECTOR FOR HEATING A FLUID

PROCTOR + SCHWARTZ, INC.
4099338 - SOLAR ASSISTED DRYER APPARATUS AND METHOD

ASSIGNED PATENTING(1/69 - 12/78) - - ALPHA LISTING

RAYMOND LEE ORGANIZATION, INC.
3831581 - LUNAR SHELTER
3981295 - SOLAR HEATING SYSTEM
4082079 - PORTABLE SOLAR OVEN AND GRILL

RAYTHEON COMPANY
4122830 - SOLAR HEATING SYSTEM

RAYTHEON CORPORATION
4043317 - VENTED SOLAR COLLECTOR
4063544 - SOLAR ENERGY COLLECTORS
4063545 - SOLAR COLLECTOR THERMOSTAT
4064866 - FLAT PLATE SOLAR HEAT COLLECTOR

RCA CORPORATION
4037014 - SEMICONDUCTOR ABSORBER FOR PHOTOTHERMAL CONVERTER
4041307 - POSITIONING A PLATFORM WITH RESPECT TO RAYS OF A LIGHT SOURCE
4126121 - SOLAR ENERGY HEAT APPARATUS

REFRIGERATION RESEARCH, INC.
4044948 - SOLAR HEATING SYSTEM COMPONENT

REYNOLDS METALS COMPANY
4082907 - THIN MOLYBDENUM COATINGS ON ALUMINUM FOR SOLAR ENERGY ABSORPTION

RIDGWAY STEEL FABRICATORS, INC.
3958755 - HYDRO-THERMO FIREPLACE AND HEATING SYSTEM THEREFOR
4131231 - FIREPLACE HEATING SYSTEM

ROBERTSHAW CONTROLS COMPANY
4071018 - SOLAR HEAT COLLECTOR SYSTEM, PARTS THEREFOR AND METHODS
4116219 - DIFFERENTIAL THERMOSTATIC CONTROLLER FOR SOLAR HEATING SYSTEM
4125107 - UNIVERSAL DIFFERENTIAL THERMOSTAT FOR SOLAR HEATING SYSTEM

ROCKWELL INTERNATIONAL CORPORATION
3973552 - METHOD OF STORING AND RELEASING THERMAL ENERGY
4054126 - SYSTEM FOR STORING AND RELEASING THERMAL ENERGY

ROHR INDUSTRIES INC.
3977773 - SOLAR ENERGY CONCENTRATOR

ROVAC CORPORATION
4017285 - HEAT PUMP-REFRIGERATION SYSTEM WITH WATER INJECTION AND REGENERATIVE HEAT EXCHANGER
4064705 - AIR CONDITIONING SYSTEM HAVING COMPRESSOR-EXPANDER IN PRESSURIZED CLOSED LOOP SYSTEM WITH SOLAR ASSIST AND THERMAL STORA
GE

SAMUEL G. DAWSON
4129118 - METHOD AND APPARATUS FOR PROVIDING DIFFERENTIAL TEMPERATURE THERMOSTAT CONTROL FOR SOLAR HOT WATER SYSTEMS

SANDERS ASSOCIATES INC.
4013885 - SOLAR ENERGY SUN TRACKER
4114685 - METHOD AND APPARATUS FOR INCREASING HEAT TRANSFER EFFICIENCY
4121564 - SOLAR ENERGY RECEIVER

ASSIGNED PATENTING(1/69 - 12/78) - - ALPHA LISTING

SCHJELDAHL, G. T., COMPANY
3924604 - SOLAR ENERGY CONVERSION SYSTEM

SCHWARTZ JOSEPH M.
3898978 - BREATHING GAS HEATER

SCIENTIFIC-ATLANTA, INC.
4009587 - COMBINED LOOP FREE-PISTON HEAT PUMP
4074705 - SOLAR COLLECTOR APPARATUS AND METHOD
4103674 - MODULAR SOLAR COLLECTOR SYSTEM
4119143 - HEAT TRANSFER SYSTEM

SCM CORPORATION
4091797 - SOLAR AIR HEATER ARRAY

SENSOR TECHNOLOGY, INC.
3990914 - TUBULAR SOLAR CELL

SES, INCORPORATED
4011190 - SELECTIVE BLACK FOR ABSORPTION OF SOLAR ENERGY

SHANTZER-WALLIN CORPORATION
4030312 - HEAT PUMPS WITH SOLAR HEAT SOURCE

SHELDAHL, INC.
4022184 - LATERAL LENS ARRANGEMENT FOR SOLAR ENERGY CONVERSION DEVICES

SOCIETE CIUILE PARTICULIERE COMINDA ENGINEERING
4090496 - COMPOUNDS FOR FORMING BODIES FOR GENERATING HEAT FROM RADIANT LUMINOUS ENERGY AND METHODS OF PREPARATION AND APPLICATIO
NS THEREOF

SOLAR APPARATUS + EQUIPMENT LIMITED
4120287 - SOLAR HEATING PANELS

SOLARAY, INC.
4099513 - SOLAR HEATING COLLECTOR

SOLAR CONTROL CORPORATION
4129116 - SOLAR AIR FLOW CONTROLLER AND SYSTEM

SOLAR ENERGY COMPANY
3939818 - SOLAR ENERGY HEATING MODULE AND ASSEMBLY

SOLAR ENERGY DYNAMICS CORPORATION
4010734 - CLOSED SYSTEM SOLAR HEATER
4060071 - SOLAR COLLECTOR FOR SOLAR HEATING SYSTEMS

SOLAR ENERGY FOR THE FAMILY INC.
4071016 - SOLAR ENERGY COLLECTING APPARATUS

ASSIGNED PATENTING(1/69 - 12/78) - - ALPHA LISTING

SOLAR ENERGY RESEARCH CORPORATION
4003365 - STRUCTURE FOR COLLECTING SOLAR ENERGY

SOLAR INDUSTRIES, INC.
4060070 - SOLAR HEATING

SOLARON CORPORATION
4072142 - HEAT ABSORBER FOR SOLAR ENERGY
4073283 - MODULAR CONSTRUCTION FOR SOLAR HEAT COLLECTOR

SOLAR PRODUCTS CORPORATION
3896786 - SOLAR STOVE

SOLAR REACTOR CORPORATION
4070861 - SOLAR REACTOR COMBUSTION CHAMBER

SOLARSYSTEMS INCORPORATED
3961619 - FLAT PLATE SOLAR COLLECTOR MODULE

SOLAR WORKS, INC.
4127104 - SOLAR HEATER FOR WATER AND THE LIKE

SOLATION PRODUCTS, INC.
4114600 - THERMAL STORAGE AND HEAT TRANSFER SYSTEM AND METHOD

SOLERGY, INC.
3974824 - SOLAR HEATING DEVICE

SOUTHERN ILLINOIS UNIVERSITY FOUNDATION
4090494 - SOLAR COLLECTOR

SPARKLER FILTERS, INC.
4108158 - SOLAR ENERGY POWERED HEAT GENERATOR

SUEHIRO SEIKI COMPANY, LTD.
4034737 - SOLAR HEAT BOILER

SUNBURST SOLAR ENERGY, INC.
4014314 - SOLAR ENERGY COLLECTOR PANEL

SUNEARTH CONSTRUCTION COMPANY, INC.
3937208 - SOLAR COLLECTOR SYSTEM

SUN-ECON, INC.
4065938 - AIR-CONDITIONING APPARATUS WITH BOOSTER HEAT EXCHANGER

SUNLIFE S.P.A.
3977601 - SYSTEM FOR RECOVERING SOLAR ENERGY AND ITS DIRECT UTILIZATION

SUN OIL COMPANY OF PENNSYLVANIA
3996919 - SYSTEM FOR COLLECTING AND STORING SOLAR ENERGY

ASSIGNED PATENTING(1/69 - 12/78) - - ALPHA LISTING

SUN POWER, INC.
3951128 - COMBINED FLAT PLATE - FOCAL POINT SOLAR HEAT COLLECTOR

SUNTEC SYSTEMS, INC.
4088120 - SOLAR CONCENTRATOR-COLLECTOR

SUN UNLIMITED RESEARCH CORPORATION
4029258 - SOLAR ENERGY COLLECTOR

SUNWALL INCORPORATED
4058109 - SOLAR HEATING AND INSULATING APPARATUS

SUNWORKS, INC.
3980071 - SOLAR ENERGY COLLECTOR
4034738 - SOLAR HEATING SYSTEM
4098259 - SOLAR ENERGY COLLECTION SYSTEM
4106483 - SOLAR ENERGY COLLECTOR
4123883 - SOLAR ENERGY COLLECTOR
4131111 - SOLAR ENERGY COLLECTOR

SUPERIOR OIL COMPANY
4042758 - PHOTOCHEMICAL CELL

SYSTEMS USING NATURE LTD.
4060916 - SOLAR HEAT EDUCATIONAL DEVICE

TAYLOR; JAY
4108156 - SOLAR-HEATED STOCK TANK

TEXACO INC.
4100091 - PROCESS AND MEANS FOR ABSORBING AND RELEASING THERMAL ENERGY BY UTILIZING THE ALLOTHOPIC CHANGE OF ENDO-5-NORBORNENE-2, 3-DICARBOXYLIC ACID ANHYDRIDE WITH HEAT

TEXAS INSTRUMENTS, INCORPORATED
4071659 - SOLAR ABSORPTION SURFACE PANEL

THERMATOOL CORPORATION
4112566 - METHOD OF MANUFACTURING HEAT EXCHANGE PANELS

THE UNIVERSITY OF CHICAGO
3923381 - RADIANT ENERGY COLLECTION

TOKYO SHIBAURA ELECTRIC CO., LTD.
4108155 - HOT AIR TYPE SOLAR HEAT-COLLECTING APPARATUS

TOLO, INCORPORATED
4103368 - POOL COVER HAVING SOLAR ENERGY HEATING FEATURE

TRANE COMPANY
4028078 - METHOD AND APPARATUS FOR ABSORPTION REFRIGERATION SYSTEM

ASSIGNED PATENTING(1/69 - 12/78) - - ALPHA LISTING

TRANTER, INC.
4086910 - SOLAR ABSORBER PANEL

TRW INC.
3451641 - THERMOELECTRIC CONVERSION SYSTEM

UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND, -
4006730 - APPARATUS FOR STORING ENERGY FROM ELECTROMAGNETIC RADIATION

UNITED STATES OF AMERICA, AGRICULTURE
4103825 - SOLAR HEATED AND COOLED DWELLING

UNITED STATES OF AMERICA, AIR FORCE
3799144 - SOLAR HEAT SOURCE AND RECEIVER SYSTEM

UNITED STATES OF AMERICA, DEPARTMENT OF ENERGY
3957031 - LIGHT COLLECTORS IN CYLINDRICAL GEOMETRY
3982526 - TURNING COLLECTORS FOR SOLAR RADIATION
3986490 - REDUCING HEAT LOSS FROM THE ENERGY ABSORBER OF A SOLAR COLLECTOR
3991740 - SEA SHELL SOLAR COLLECTOR
3993458 - METHOD FOR PRODUCING SYNTHETIC FUELS FROM SOLID WASTE
3994279 - SOLAR COLLECTOR WITH IMPROVED THERMAL CONCENTRATION
4002499 - RADIANT ENERGY COLLECTOR
4007729 - MEANS OF INCREASING EFFICIENCY OF CPC SOLAR ENERGY COLLECTOR
4010733 - STRUCTURALLY INTEGRATED STEEL SOLAR COLLECTOR
4029519 - SOLAR COLLECTOR HAVING A SOLID TRANSMISSION MEDIUM
4044752 - SOLAR COLLECTOR WITH ALTITUDE TRACKING
4044819 - HYDRIDE HEAT PUMP
4048980 - SOLAR RADIATION ABSORBING MATERIAL
4052976 - NON-TRACKING SOLAR CONCENTRATOR WITH A HIGH CONCENTRATION RATIO
4067316 - SOLAR ENERGY COLLECTOR
4078544 - CORRUGATED COVER PLATE FOR FLAT PLATE COLLECTOR
4099515 - FABRICATION OF TROUGH-SHAPED SOLAR COLLECTORS
4114592 - CYLINDRICAL RADIANT ENERGY DIRECTION DEVICE WITH REFRACTIVE MEDIUM
4120565 - PRISMS WITH TOTAL INTERNAL REFLECTION AS SOLAR REFLECTORS
4130107 - SOLAR CONCENTRATOR WITH RESTRICTED EXIT ANGLES

UNITED STATES OF AMERICA, INTERIOR
3599438 - CRUDE HELIUM ENRICHMENT PROCESS
3620206 - FLUID HEATING BY RADIATION
4098956 - SPECTRALLY SELECTIVE SOLAR ABSORBERS

UNITED STATES OF AMERICA, NATIONAL AERONAUTICS AND SPACE ADM
3431397 - HEAT SHIELD OVEN
3493291 - HIGH TEMPERATURE LENS CONSTRUCTION
3597281 - RECOVERY OF RADIATION DAMAGED SOLAR CELLS THROUGH THERMAL ANNEALING
3807384 - APPARATUS FOR CONTROLLING THE TEMPERATURE OF BALLOON-BORNE EQUIPMENT
3903699 - SOLAR ENERGY POWER SYSTEM
3915148 - THERMOSTATICALLY CONTROLLED NON-TRACKING TYPE SOLAR ENERGY CONCENTRATOR
3920413 - PANEL FOR SELECTIVELY ABSORBING SOLAR THERMAL ENERGY AND THE METHOD OF PRODUCING SAID PANEL
3951129 - SOLAR ENERGY ABSORBER
3957030 - SOLAR ENERGY POWER SYSTEM

ASSIGNED PATENTING(1/69 - 12/78) - - ALPHA LISTING

UNITED STATES OF AMERICA, NATIONAL AERONAUTICS AND SPACE ADM (CONTINUED)
3958553 - SOLAR ENERGY TRAP
4011854 - MOUNT FOR CONTINUOUSLY ORIENTING A COLLECTOR DISH IN A SYSTEM ADAPTED TO PERFORM BOTH DIURNAL AND SEASONAL SOLAR TRACKIN G
4055707 - SELECTIVE COATING FOR SOLAR PANELS
4062347 - SOLAR HEATING SYSTEM
4091800 - SOLAR POND

UNITED STATES OF AMERICA, NAVY
3671286 - SURFACE WITH LOW ABSORPTIVITY TO EMISSIVITY RATIO
3780722 - FIBER OPTICAL SOLAR COLLECTOR
3986021 - PASSIVE SOLAR TRACKING SYSTEM FOR STEERABLE FRESNEL ELEMENTS
4029853 - PBS-AL SELECTIVE SOLAR ABSORBER

UNIVERSAL CONSTRUCTION INDUSTRIES, INC.
4076013 - SOLAR HEATING SYSTEM

UNIVERSITY OF CALIFORNIA, THE REGENTS OF
3587931 - MACHINE FOR DEPOSITING GRAPES
3751821 - RAISIN GRAPE SPREADER

UNIVERSITY OF CHICAGO
4003638 - RADIANT ENERGY COLLECTION

UNIVERSITY OF DAYTON
3939819 - SOLAR RADIANT ENERGY COLLECTOR

UNIVERSITY OF DELAWARE
4010620 - COOLING SYSTEM
4034736 - SOLAR HEATING METHOD AND APPARATUS

UNIVERSITY OF GUYANA
4023375 - WATER-AMMONIA REFRIGERATION SYSTEM USING SOLAR ENERGY

UNIVERSITY OF KENTUCKY RESEARCH FOUNDATION
4026273 - SOLAR FLUID HEATER WITH ELECTROMAGNETIC RADIATION TRAP

UNIVERSITY OF MINNESOTA, THE REGENTS OF
4015582 - SOLAR HEAT COLLECTOR

UNIVERSITY PATENTS, INC.
4050443 - SOLAR ENERGY DEVICE AND SYSTEM

UOP INC.
3908632 - SOLAR HEAT ABSORBING SYSTEM
3929122 - SOLAR ENERGY COLLECTOR
3968786 - SOLAR HEAT ABSORBING TUBING
3972316 - SOLAR ENERGY COLLECTOR WITH MOVING BELT ABSORBER
3996092 - METHOD OF MAKING LAMINATED ABSORBER MEMBER FOR FLAT PLATE COLLECTOR
4007776 - HEATING AND COOLING SYSTEM UTILIZING SOLAR ENERGY
4023556 - LAMINATED ABSORBER MEMBER FOR FLAT PLATE SOLAR COLLECTOR AND METHOD OF MAKING SAME
4023557 - SOLAR COLLECTOR UTILIZING COPPER LINED ALUMINUM TUBING AND METHOD OF MAKING SUCH TUBING
4036208 - FINNED TUBE SOLAR ENERGY ABSORBER

ASSIGNEO PATENTING(1/69 - 12/78) - - ALPHA LISTING
(CONTINUEO)

UOP INC.
4041318 - SOLAR HEAT-LIGHT RECOVERY SYSTEM
4078975 - SOLAR POTABLE WATER RECOVERY AND POWER GENERATION FROM SALINOUS WATER
4078976 - SOLAR POTABLE WATER RECOVERY ANO POWER GENERATION FROM SALINOUS WATER
4110172 - SOLAR ENERGY COLLECTING POND
4121567 - SOLAR ENERGY COLLECTING POND ANO COVERING THEREFOR

U.S. PHILIPS CORPORATION
4080269 - METHOO OF PROOUCING COATINGS HAVING A HIGH ABSORPTION IN THE RANGE OF THE SOLAR SPECTRUM
4091793 - SOLAR COLLECTOR
4122831 - SOLAR COLLECTOR COMPRISING AN ELONGATE ABSORBER IN AN EVACUATEO TRANSPARENT TUBE

VAN DYKE; HOMER
4108154 - SOLAR ENERGY COLLECTION SYSTEM
4115177 - MANUFACTURE OF SOLAR REFLECTORS

VARIAN ASSOCIATES, INC.
4002031 - SOLAR ENERGY CONVERTER WITH WASTE HEAT ENGINE

VOLKSWAGENWERK AKTIENGESELLSCHAFT
4059095 - OEVICE FOR UTILIZING THE HEAT ENERGY OF SOLAR RAOIATION

WATT RICHARD EDWIN
3998207 - OIFFERENTIAL TEMPERATURE CONTROLLER FOR USE IN A SOLAR ENERGY CONVERSION SYSTEM

WEBB; WELLS A.
4127947 - METHOO ANO APPARATUS FOR EVAPORATION OF MOISTURE FROM FRUIT ANO VEGETABLE PARTICLES

WERNER, FRANK D.
4086908 - PERFORATED HEAT TRANSFER SHEET

WESTINGHOUSE ELECTRIC CORP.
4012920 - HEATING ANO COOLING SYSTEM WITH HEAT PUMP ANO STORAGE
4029080 - THERMAL COLLECTOR OF SOLAR ENERGY AOAPTEO FOR HIGH TEMPERATURE OPERATION
4095428 - SOLAR ELECTRIC POWER PLANT AND AN IMPROVEO THERMAL COLLECTOR OF SOLAR ENERGY

WESTMAN MANUFACTURING COMPANY
3983861 - SOLAR ENERGY CONVERSION DEVICE

WHITELINE, INC.
4127926 - METHOO OF MAKING SOLAR REFLECTORS

WILSON SOLAR KINETICS
3954097 - SOLAR HEAT COLLECTOR

WORMSER SCIENTIFIC CORPORATION
3841302 - SOLAR ENERGY SYSTEM FOR A BUILOING

XENCO LTO.
4015962 - TEMPERATURE CONTROL SYSTEM UTILIZING NATURALLY OCCURRING ENERGY SOURCES

ASSIGNED PATENTING(1/69 - 12/78) - - ALPHA LISTING

XONICS, INC.
4046134 - SOLAR HEATER WITH AUTOMATIC VENTING

YAZAKI SOGYO KABUSHIKI KAISHA
4084578 - SOLAR WATER HEATER OF NATURAL CIRCULATION TYPE

YING MFG. CORPORATION
4084579 - LIGHTWEIGHT SOLAR HEATER EMPLOYING TUBES AND CHANNELS

ZOMEWORKS CORPORATION
3884414 - SOLAR HEATING DEVICE

RHO SIGMA
4109639 - SOLAR HEATING SYSTEM

SOLAR ENERGY RESEARCH CORP.
4111187 - MODULAR SOLAR RADIATION COLLECTOR

SOLAR ENERGY SYSTEMS, INC.
4119086 - STORAGE TANK ASSEMBLY

UNASSIGNED PATENTS (1/75-12-78) INVENTORS (ALPHA LISTING)

INVENTOR NAME	STREET	CITY	ST	ZIP/CNTRY
ADCOCK THOMAS P.	300 MEADOWBROOK DR.	HUNTSVILLE	AL	35803
4129177 - SOLAR HEATING AND COOLING SYSTEM				
ALGAIER ARTHUR J.	3628 N. 101ST ST.	WAUWATOSA	WI	53225
3990635 - WINDOW MOUNTED SOLAR HEATING UNIT				
ALTMAN GERALD	41 WESTMINSTER ROAD	NEWTON	MA	02159
3994277 - RADIATION COOLING DEVICES AND PROCESSES				
ANDERSON HENRY JR.	9401 SEMINOLE ST.	SILVER SPRING	MD	20901
3861379 - LOW PROFILE SOLAR RAY CONCENTRATOR				
ANDERSON JOHN HARLAND	5 WOODCREST DRIVE	BURNSVILLE	MN	55337
4047518 - SOLAR HEATING CELL				
ANDERSSON LARS O.	12 ROPUDOSVAGEN	SALTSJOBADEN		SE
4124062 - METHOD AND DEVICE FOR CONTROLLING THE TEMPERATURE IN A PREMISE				
ANDRASSY STELLA	RIDGE RD.	KINGSTON	NJ	08528
4089326 - HEATER				
ANDRASSY STELLA	RIDGE ROAD	KINGSTON	NJ	08528
3938497 - APPARATUS FOR SOLAR COOKING				
ANGILLETTA DOMENICK J.	223 E. KNIGHT AVE.	COLLINGSWOOD	NJ	08108
3960135 - SOLAR HEATER AND THERMAL BARRIER				
4002159 - VENETIAN BLIND FOR SOLAR HEATING				
ARBOGAST PORTER R.	281 W. LANGHORNE AVE.	BETHLEHEM	PA	18017
4056313 - MULTIPLE MIRRORED APPARATUS UTILIZING SOLAR ENERGY				
ARENT ASA S.	700 - 15TH ST., NORTH	HUMBOLDT	IA	50548
4043316 - MODULAR DIRECT SOLAR HEAT WINDOW UNIT				
ARNBERG B. THOMAS	2885 KENYON CIRCLE	BOULDER	CO	80303
4047517 - METHOD AND APPARATUS FOR RECEIVING SOLAR ENERGY				
ARTHUR DAVID M.	4020 N. 14TH AVE.	PHOENIX	AZ	85013
4010614 - SOLAR RADIATION COLLECTOR AND SYSTEM FOR CONVERTING AND STORING COLLECTED SOLAR ENERGY				
ASHTON LARRY	1791 IDE COURT	THOUSAND OAKS	CA	91360
4061132 - CONTROL VALVE MEANS PARTICULARLY ADAPTED FOR SWIMMING POOL HEATER INSTALLATIONS EMBODYING A SOLAR HEATER				
ATKINSON DAVID L.	23608 48 WEST	MOUNTLAKE TERRACE	WA	98043
4059226 - HEAT COLLECTOR AND STORAGE CHAMBER				
AWALT THOMAS Y. JR.	804 POINCIANA DRIVE	GULF BREEZE	FL	32561
4050626 - SUPPLEMENTAL HEAT AND HEAT TRANSFER SUBSYSTEMS FOR SOLAR AIR CONDITIONING SYSTEMS				
BAILEY PAUL F.	511 SW. 10TH AVE.	PORTLAND	OR	97205
4023555 - SOLAR HEATING DEVICE				

UNASSIGNED PATENTS (1/75-12-78) INVENTORS (ALPHA LISTING)

INVENTOR NAME	STREET	CITY	ST	ZIP/CNTRY
BAKUN PAUL	14 TERRACE COURT	OLD WESTBURY	NY	11568
4037583 - SOLAR HEATING SYSTEM AND PANELS				
BAKUN PAUL	14 TERRACE CT.	OLD WESTBURY	NY	11568
4125108 - PANELS FOR SOLAR HEATING SYSTEM				
BALKUS CARL E. JR.	147 DEEPWOOD DRIVE	AMSTON	CT	06231
4003364 - SOLAR HEATING SYSTEM				
BANET JOSEPH	112 UZIEL STR.	JERUSALEM		IL
4076024 - SOLAR RADIATION COLLECTOR				
BANSAL JAG M.	1301 HIGHWAY NO. 7	HOPKINS	MN	55343
4117830 - GANGABLE RADIANT ENERGY COLLECTOR				
BAR-ON BENJAMIN	15 HACARMEL ST.	RISHON LEZION		IL
4103675 - SOLAR COLLECTORS				
BARD ROBERT F.	1201 SW. CARDINELL DRIVE	PORTLAND	OR	97201
3985118 - SOLAR FURNACE				
BARGER HAROLD E.		PAXTON	NB	69155
4056093 - SOLAR HEATER				
BARKER HAROLD REED	805 29TH ST. #252	PITTSBORO	NC	80303
4114595 - SOLAR ENERGY CDLLECTDR AND GLAZING SYSTEM				
BARRIO DE MENDOZA CAYO PETRONIO	2402 N. 39TH PLACE	PHOENIX	AZ	85008
4059094 - SOLAR ENERGY COLLECTOR APPARATUS				
BASH D'ARLE G.	10345 SW. 117TH ST.	MIAMI	FL	33176
4002032 - SOLAR HEATED DEVICE				
BEAVER EMIL ROUTZONG JR.	4148 S. CRANE ROAD	TIPP CITY	OH	45371
4030478 - SOLAR ENERGY COLLECTORS				
BENNETT CHRISTOPHER JOHN	LITTLE STRATTON, MOOR HALL LAN	DANBURY, ESSEX CM3 4		EN
4080957 - SOLAR PANEL				
BENSDN PHILLIP D.	2026 E. LAKESHDRE DR.	AGOURA	CA	91301
4090498 - SOLAR HEATER				
BERMAN MARK H.	144 SPRING ST.	PASSAIC	NJ	07055
4127102 - HEAT ABSORBING WINDOW				
BEZBORODKO JOSEPH A.	699 W. 239TH ST.	BRONX	NY	10463
4038971 - CONCAVE, MIRRORED SOLAR COLLECTOR				
BIGGS HERBERT W.	P.O. BOX 1510	HOBE SOUND	FL	33455
4094377 - ELECTRICALLY POWERED VEHICLE				
BLOCK LEO	4188 LAKE HARBOR LANE	WESTLAKE VILLAGE	CA	91361
4061132 - CONTROL VALVE MEANS PARTICULARLY ADAPTED FOR SWIMMING POOL HEATER INSTALLATIONS EMBODYING A SOLAR HEATER				

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INVENTOR NAME			STREET	CITY	ST	ZIP/CNTRY
BLUM	HAROLD	A.	3501 MILTON	DALLAS	TX	75205
3916871 - FLAT PLATE SOLAR COLLECTOR MODULE						
BOTTUM	EDWARD	W.	525 N. FIFTH ST.	BRIGHTON	MI	48116
4026272 - SOLAR COLLECTOR						
BOTTUM	EDWARD	W.	9357 SPENCER RD.	BRIGHTON	MI	48116
4120289 - REFRIGERANT CHARGED SOLAR WATER HEATING STRUCTURE AND SYSTEM						
4130110 - SOLAR HEATING SYSTEM COMPONENT AND CONTROL THEREFOR						
BOTTUM	EDWARD	W.	9357 SPENCER ROAD	BRIGHTON	MI	48116
4049407 - SOLAR ASSISTED HEAT PUMP SYSTEM						
BOWLES	VERNON	O.		NAPLES	FL	
4096861 - SOLAR HEAT COLLECTION						
BOWLES	VERNON	O.	342 THIRD AVE. N.	NAPLES	FL	33940
4085733 - ROOF-MOUNTABLE CHAMBER AND CONDUIT DEVICE FOR SOLAR HEAT COLLECTING APPARATUS						
BRINJEVEC	HEINZ	J.	3990 RIBEROY ROAD	WINDSOR, ONTARIO		CA
4047385 - SOLAR TO ELECTRICAL ENERGY CONVERTING SYSTEM						
BRISCOE	HARRY	H.	RTE. 10. BURNETT FERRY RD.	ROME	GA	30161
4125222 - SOLAR HEAT AUGMENTED HEATING SYSTEM AND TEMPERATURE RESPONSIVE GABLE VENT						
BROKAW	HAL	R.	P.O. BOX 273	CARMEL	CA	93921
4098264 - SOLAR LIQUID HEATING APPARATUS						
BROSS	THEODORE	O.	62 HIGH RIDGE RD.	WEST HARTFORD	CT	06117
4126122 - SOLAR HOT WATER BOOSTER AND EXCHANGER FOR USE THEREIN						
BROWNFIELD	JERRY	A.	107 W. RUSTIC LODGE AVE.	MINNEAPOLIS	MN	55409
4117828 - SOLAR COLLECTOR						
BRUECK	CHRIS	M.	615 CHESTNUT	MUSCATINE	IA	52761
4130109 - SOLAR ENERGY CONCENTRATOR						
BRUEL	PER	WILHELM	FUGLEVAGSVEIG 5	OK-2960 RUNGSTED		OK
4047516 - PIPE JOINT FOR RADIATOR ELEMENT OF THIN MATERIAL						
BRUGGER	HANS		GRAN VIEW 9-W	NYACK	NY	10960
4037652 - SOLAR HEAT STORAGE SYSTEM						
BRYCE	NORMAN	K.	P.O. BOX 685	PIMA	AZ	85543
3999389 - SOLAR ENERGY CONVERTER						
BRYNJESTAD	ULF		1047 W. ASHBRIDGE LA.	HARBOR CITY	CA	90710
4103673 - NON-TRACKING SOLAR ENERGY CONCENTRATOR						
BUNCH	JESSE	C.	1008 KERWIN RD.	SILVER SPRING	MD	20901
4110009 - HELIOSTAT APPARATUS						

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INVENTOR NAME	STREET	CITY	ST	ZIP/CNTRY
BURD DAVID MILLER	1841 R ST. NW.	WASHINGTON	DC	20009
4116220 - SOLAR ENERGY COLLECTOR				
BURNETT JAMES T.	RIVER BANK ROAD	BATESVILLE	AR	72501
4031702 - MEANS FOR ACTIVATING HYDRAULIC MOTORS				
CAMPBELL WILLIAM PATRICK III	3310 ROWLAND PL.	WASHINGTON	DC	20008
4081289 - SOLAR ENERGY SYSTEM				
CAPLAN HARRY W.	3397 E. MONMOUTH RD.	CLEVELAND HEIGHTS	OH	44118
3906927 - SOLAR-THERMAL POWER SYSTEM EMPLOYING ADJUSTABLE CURVATURE REFLECTIVE PANELS AND METHOD OF ADJUSTING REFLECTIVE PANEL CURVATURE				
CAPLAN HARRY W.	3397 E. MONMOUTH ROAD	CLEVELAND HEIGHTS	OH	44118
3959056 - LIGHTWEIGHT REFLECTIVE PANELS FOR SOLAR-THERMAL POWER PLANTS AND METHODS OF FORMING SUCH PANELS				
CARLSON INGEMAR	NYBROVAG 6	78100 BORLANGE		SE
4100915 - SOLAR ENERGY HEATING APPARATUS				
CAULIER DANIEL PIERRE	ROUTE D'AIX	13122 VENTABREN (BOU		FR
4099516 - SOLAR ENERGY PICK-UP				
CEIDEBURG JOHN W.	P.O. BOX 259	APTOS	CA	95003
4052975 - SOLAR HEAT COLLECTOR AND STORAGE SYSTEM				
CHADICK RICHARD E.	2741 E. 219TH ST.	LONG BEACH	CA	90810
4079725 - SOLAR LADDER				
CHANG WEI-YI	9605 LA PLAYA ST. NE.	ALBUQUERQUE	NM	87111
4114596 - METHOD AND APPARATUS FOR TRACKING THE SUN FOR USE IN A SOLAR COLLECTOR WITH LINEAR FOCUSING MEANS				
CHAROUDI DAY	5A NEWTON PLACE	SOMERVILLE	MA	02143
3953110 - TRANSPARENT THERMAL INSULATING SYSTEM				
CHENG CHEN-YEN	9605 LA PLAYA ST. NE.	ALBUQUERQUE	NM	87111
3982527 - METHOD AND APPARATUS FOR CONCENTRATING, HARVESTING AND STORING OF SOLAR ENERGY				
CHENG CHEN-YEN	9605 LA PLAYA ST. NE.	ALBUQUERQUE	NM	87111
4114596 - METHOD AND APPARATUS FOR TRACKING THE SUN FOR USE IN A SOLAR COLLECTOR WITH LINEAR FOCUSING MEANS				
CHENG SING-WANG	NO. 1, LANE NO. 479, FU-SHING	TAIPEI		CT
3982527 - METHOD AND APPARATUS FOR CONCENTRATING, HARVESTING AND STORING OF SOLAR ENERGY				
CHEVALIER DONALD M.	248 15TH AVE. S.	GREAT FALLS	MT	59405
3968652 - APPARATUS RESPONSIVE TO SOLAR ENERGY FOR PRODUCING POWER				
CHIARELLI CARL	20 LAKE END ROAD	MERRICK	NY	11566
4040566 - POLLUTION-FREE HEATING SYSTEM				
CHRISTIANSON NEIL B.	10813 BROADWATER DR.	FAIRFAX	VA	22030
4085667 - ATTIC EXHAUST SYSTEM				

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INVENTOR NAME	STREET	CITY	ST	ZIP/CNTRY
CHROMIE EDSEL	6720 BELLE GLADE	SAN DIEGO	CA	92119
4103151 - SOLAR TRACKING SYSTEM				
CHUBB TALBOT A.	5023 N. 38TH ST.	ARLINGTON	VA	22207
3997001 - HEAT ENERGY RESERVOIR USING SOLID REMOVAL AND GRAVITATION SETTLING IN A MOLTEN-SOLID SALT BATH				
COHEN JEFFREY M.	2201 PENNSYLVANIA AVE.	PHILADELPHIA	PA	19130
4022188 - HIGH EFFICIENCY SOLAR COLLECTOR				
COLEMAN RICH F.	117 "P" ST.	SALT LAKE CITY	UT	84103
4026267 - SOLAR ENERGY APPARATUS				
COLLIE ROBERT L.	2507 CATALINA DRIVE	ORLANDO	FL	32805
3955554 - SOLAR HEATING SYSTEM				
COLLURA FRANK	2926 W. JEAN ST.	TAMPA	FL	33610
4027652 - SOLAR ENERGY COLLECTOR				
COOK THOMAS E.	3570 MAIZE ROAD	COLUMBUS	OH	43224
4046133 - SOLAR PANEL ASSEMBLY FOR FLUID HEATING AND METHOD				
COOPER NATHAN E.	BROOKSIDE DRIVE	WOODBRIDGE	CT	06525
4043315 - SOLAR HEAT COLLECTOR				
COPPING BRUCE G.	310 BURNING TREE DRIVE	NAPLES	FL	33940
4076026 - SOLAR HEATER				
COSTELLO FREDERICK A.	1605 AYRE ST.	NEWPORT	DE	19804
4055163 - SOLAR HEATING SYSTEM				
COTSWORTH JOHN L.	11 LAKE RD.	SHORT HILLS	NJ	07078
4120284 - CLIP FOR CLINCHING A HEAT EXCHANGE CONDUIT WITH A SOLAR HEAT ABSORBER				
CRAWFORD F. ROBERT	316 BAYSHORE DR.	OSPREY	FL	33559
3859980 - SOLAR HEATER				
CUNNINGHAM JOHN JOSEPH	BOX 180	SCHUYLERVILLE	NY	12871
4083490 - SOLAR SUPPLEMENTAL HEATING SYSTEM				
CUNNINGHAM MARION L.	3210 WICKERSHAM CT.	ORLANDO	FL	32806
4019495 - CONTROL SYSTEM FOR SOLAR HEATER				
CUSTER WARREN L.	R.D. NO. 3, BOX 2050	LIGONIER	PA	15658
3981445 - VARIABLE VOLUME AIR WALL				
CUTCHAW JOHN M.	7333 E. VIRGINIA	SCOTTSDALE	AZ	85257
3923038 - SOLAR ENERGY COLLECTOR PANEL				
D'ASCOLI JOHN	3 S. SHORE DRIVE	NEW PORT RICHEY	FL	33552
4038970 - SOLAR WATER HEATER				
DAMPIER WILLIAM P.	525 COMANCHE DR.	PLACENTIA	CA	92670
4079591 - SOLAR POWER PLANT				

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INVENTOR NAME			STREET	CITY	ST	ZIP/CNTRY
DAVIS	EDWIN	J.	2329 W. 2ND	DAVENPORT	IA	52802
4112919 - WINDOW SOLAR HEATING UNIT						
DAWLEY	RICHARD	W.	2164 BONNIE DR.	WEST PALM BEACH	FL	33406
4080956 - SOLAR HEAT ABSORBER						
DE WILDE	GERRIT		A. E. THURSTON, RT. 4	EUGENE	OR	97405
4080954 - SOLAR COLLECTOR APPARATUS						
DECKER	BERT	J.	136 COPEN BLVD.	BUFFALO	NY	14226
4122356 - SOLAR HEAT PIPE FEEDBACK TURBOGENERATOR						
DEGEUS	ARIE	M.	6625 - 4TH ST. SOUTH	ST. PETERSBURG		33
4081966 - SOLAR OPERATED CLOSED SYSTEM POWER GENERATOR						
DEPEW	WALTER	L.	3111 W. 54TH AVE.	DENVER	CO	80221
4064865 - SOLAR ACTUATED BOILER AND APPURTENANCES						
DERBY	RONALD	C.	11162 WICKFORD DR.	SANTA ANA	CA	92705
4079591 - SOLAR POWER PLANT						
DIGGS	RICHARD	E.	S. 12A ROAD, P.O. BOX 776	CARTHAGE	MO	64836
4030890 - SOLAR POWER SYSTEM						
DIGGS	RICHARD	E.	12A ROAD	CARTHAGE	MO	64836
4000850 - SOLAR HEATED AND COOLED MODULAR BUILDING						
DIGGS	WILLIAM	F.	3302 CLIFTON AVE.	BALTIMORE	MD	21216
3993041 - SOLAR ENERGIZED STEAM GENERATOR SYSTEM						
DIMITROFF	BORIS		4014 PERLITA AVE. NO. 6	LOS ANGELES	CA	90039
4068474 - APPARATUS AND PROCESS FOR STEAM GENERATION BY SOLAR ENERGY						
DIPERI	LEONARD	J.	18325 LAHEY ST.	NORTHRIDGE	CA	91324
4122828 - SOLAR ENERGY COLLECTOR FOR DIRECT AIR HEATING						
DIPINTO	ANTHONY	J.	1605 AYRE ST.	NEWPORT	DE	19804
4055163 - SOLAR HEATING SYSTEM						
DIX	SYDNEY		48 THE POINT	CORONADO	CA	92118
3965683 - SOLAR ELECTRICAL GENERATING SYSTEM						
DOLAMORE	PETER	WILLIAM	P.O. BOX 10142	JOHANNESBURG		ZA
4050444 - REFLECTIVE DEVICE						
DREW	GEORGE	F.	1113 - 28TH ST., NW.	WINTER HAVEN	FL	33880
4038964 - PARABOLIC SOLAR CONCENTRATOR EMPLOYING FLAT PLATE COLLECTOR						
DRUCKER	ERNEST	R.	86 SAGINAW CRESCENT	OTTAWA		CA
3979597 - SOLAR POWER PLANT						
ECKELS	ROBERT	E.	2101 YOUNGFIELD	GOLDEN	CO	80401
4119084 - BUILDING WITH PASSIVE SOLAR ENERGY CONDITIONING						

UNASSIGNED PATENTS (1/75-12-78) INVENTORS (ALPHA LISTING)

INVENTOR NAME			STREET	CITY	ST	ZIP/CNTRY
ECKELS	ROBERT	E.	2101 YOUNGFIELD ST.	GOLDEN	CO	80401
4033324 - SOLAR HEAT COLLECTOR						
4054125 - SOLAR HEATING WINDOW COVER						
EDMONDSON	WILLIAM	B.	4701 SALERNO ST.	SAN DIEGO	CA	92111
3952725 - SOLAR WATER HEATER						
EDWARDS	DOUGLAS	W.	5176 LUKENS ROAD	GROVE CITY	OH	43123
4069973 - THERMAL DISTRIBUTION AND STORAGE SYSTEM FOR SOLAR AND OTHER HEATING AND COOLING						
ERWIN	SAMUEL	F.	BOX 1737	CAMP VERDE	AZ	86322
4125109 - SOLAR OVEN						
ESHELMAN	FRANK	R.	910 FIFTH ST.	AMES	IA	50010
4011855 - SOLAR COLLECTOR						
ESPY	PATRICK	N.	10,008 HICKORY HILL LA. SE.	HUNTSVILLE	AL	35803
4120282 - SOLAR RADIATION REFLECTOR AND COLLECTOR ARRAY						
ESTES	JAMES	M.	3533 WESTFIELD	FORT WORTH	TX	76133
3916871 - FLAT PLATE SOLAR COLLECTOR MODULE						
FALBEL	GERALD		472 WESTOVER ROAD	STAMFORD	CT	06902
3923039 - SOLAR ENERGY HEATING SYSTEM						
FARBER	ERICH	A.	1218 NE. 5TH ST.	GAINESVILLE	FL	32601
4023948 - SOLAR ENERGY REFRIGERATION AND AIR CONDITIONING SYSTEM						
FARBER	JOSEPH		1605 SHERINGTON PL.	NEWPORT BEACH	CA	92663
4120286 - RIDGED SURFACE SOLAR HEATER						
FATTOR	ARTHUR		5380 S. HOLLY	ENGLEWOOD	CO	80110
4015585 - SOLAR HEATING APPARATUS						
FISCHER	LAWRENCE		302 CENTER ST.	REDWOOD CITY	CA	94061
4083357 - SOLAR COOKER						
FLETCHER	JAMES	C.		ADMINISTRATOR OF THE	CA	
4065053 - LOW COST SOLAR ENERGY COLLECTION SYSTEM						
FLETCHER	JAMES	C.		ALTADENA	CA	
4111184 - SUN TRACKING SOLAR ENERGY COLLECTOR						
FLETCHER	JAMES	C.		LA CANADA	CA	
4044753 - SOLAR ENERGY COLLECTION SYSTEM						
FLETCHER	JAMES	C.		LACANADA	CA	
4091798 - NON-TRACKING SOLAR ENERGY COLLECTOR SYSTEM						
FLETCHER	JAMES	C.		PASADENA	CA	
4051834 - PORTABLE, LINEAR-FOCUSED SOLAR THERMAL ENERGY COLLECTING SYSTEM						

UNASSIGNED PATENTS (1/75-12-78) INVENTORS (ALPHA LISTING)

INVENTOR NAME			STREET	CITY	ST	ZIP/CNTRY
FOWLER	JOE	W.	IRON WORKS RD., APT. 2, BOX 39	REIDSVILLE	NC	27320
4114288 - BULK CURE TOBACCO BARN WITH IMPROVEMENTS IN CONSTRUCTION FOR OPTIMIZING HEATING EFFICIENCY						
FRANK	MATTHEW	WILLIAM	745 S. 44TH	BOULDER	CO	80303
3875926 - SOLAR THERMAL ENERGY COLLECTION SYSTEM						
FRAZIER	CLIVE	A.	5325 CURRY FORD ROAD A-203	ORLANDO	FL	32806
4019495 - CONTROL SYSTEM FOR SOLAR HEATER						
FREEMAN	JOHN	M.	1106 N. VILLA DR.	EVANSVILLE	IN	47711
4086912 - SOLAR COLLECTOR PANEL						
FROSCH	ROBERT	A.		PASADENA	CA	
4131336 - PRIMARY REFLECTOR FOR SOLAR ENERGY COLLECTION SYSTEMS						
FUCHS	DOROTHY	J.	9 UNIVERSITY WAY	PRINCETON	NJ	08540
3998204 - FLOATABLE BALL						
FUTCH	WILBUR	O.	P.O. BOX 947	BRANDON	FL	33511
4086911 - SOLAR HEATING DEVICE						
GARNER	RICHARD	L.	2211 WALKER AVE.	GREENSBORO	NC	27403
4077392 - NOVEL SOLAR COLLECTOR						
GARRETT	DONALD	E.	505 W. NINTH ST.	CLAREMONT	CA	91711
4063419 - ENERGY PRODUCTION FROM SOLAR PONDS						
GARRISS	DANIEL	E.	1905 BROOKSIDE DR.	EDGEWOOD	MD	21040
4128123 - PASSIVE HEAT-TRANSPORT SYSTEM						
GELLERT	DONALD	P.	BOX 37, R.F.D. 1	PLYMOUTH	NH	03264
4074704 - PROCESS OF AND APPARATUS FOR SOLAR HEATING AND THE LIKE						
GIBBS	NORMAN	S.	RTE. 1, BOX 176	LOVELAND	CO	80537
4085734 - SOLAR HEATERS						
GLAS	LARS-OLOF		FABRIKSVAGEN 1	VASTERHANINGE		SW
4044949 - HEAT STORAGE SYSTEM						
GLICKMAN	LEONARD		3001 N. BAY RD.	MIAMI BEACH	FL	33140
3903700 - SUNSHINE HYDRO ELECTRICITY						
GLOVER	DONALD	FRANCIS	4128 SIR WALTER ROAD	OLNEY	MD	20832
4049194 - FIREPLACE/FORCED AIR FURNACE HEAT GENERATION AND DISTRIBUTION SYSTEM						
GOETTL	WILLIAM	H.	2005 E. INDIAN SCHOOL	PHOENIX	AZ	85018
4066118 - AIR CONDITIONING SYSTEM						
4098260 - SOLAR HEAT COLLECTOR AND RADIATOR FOR BUILDING ROOF						
GONZALEZ	ED		2284 NE. 1ST AVE.	BOCA RATON	FL	33432
4055162 - SOLAR ENERGY COLLECTOR						

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INVENTOR NAME			STREET	CITY	ST	ZIP/CNTRY
GONZALEZ	EDUARDO	E.	2284 NE. FIRST ST.	BOCA RATON	FL	33432
4061130 - SOLAR ENERGY DEVICE						
GORDON	ROBERT	M.	62, NEW WINDSOR ROAD	AVONDALE, AUCKLAND		NZ
4024853 - SOLAR HEATER						
GORNIAK	JERRY		2317 E. 43RD ST.	ERIE	PA	16510
4029077 - SOLAR ENERGY COLLECTOR						
4108157 - SOLAR ENERGY COLLECTOR						
GRAMER	EBEN	J.	98 CABRINI BLVD.	GOLDEN	CO	80401
3965887 - METHOD OF HEATING A LIQUID AND SOLAR HEATING PANEL THEREFOR						
GRANGER	FLOYD	RANDOLPH	24 HEARD DRIVE	GREENVILLE	SC	29605
4051999 - ENVIRONMENTALLY HEATED AND COOLED BUILDING						
GRAVELY	BEN	T.	7001 BUCKHEAD DR.	RALEIGH	NC	27609
4098265 - SOLAR ENERGY COLLECTOR						
GRAY	STEPHEN	R.	2772 ALLEGHENY AVE.	COLUMBUS	OH	43209
3970070 - SOLAR HEATING SYSTEM						
GRIFFITHS	KENNETH	F.	31 LONDON TER.	NEW ROCHELLE	NY	10804
4095997 - COMBINED SOLAR CELL AND HOT AIR COLLECTOR APPARATUS						
GRISBROOK	ROBERT	B.	594 GEDERSON LA.	ST. LOUIS COUNTY	MO	63122
4121565 - SOLAR HEATING UNIT						
GROSSMAN	ABRAHAM		9339 RHEA AVE.	NORTHRIDGE	CA	91325
4003363 - SOLAR PANEL CONSTRUCTION						
GRUETTNER	HENRY		41 VALLEY ROAD	LEVITTOWN	PA	19057
4063547 - SOLAR HEATER						
GUBA	PETER		786 MALIBU LANE	INDIALANTIC	FL	32903
4007728 - SOLAR COLLECTOR						
GUERTIN	EMILE		WHEELER RD.	MARSTONS MILLS	MA	02648
4114593 - SOLAR HEATING SYSTEM						
HABERMAN	LOUIS	B.	C/O SOLAREX HYDRAULICS CORP.,	DEER PARK	NY	11729
4015584 - PARABOLIC SOLAR ENERGY HEAT EXCHANGER						
HABERTHIER	WILBERT	L.	660 G AVE.	LIMON	CO	80828
4111183 - SOLAR HEATING UNIT						
HADCROFT	JOHN	MACKAY	190 WAIMUNU RD.	MASSEY		NZ
4096850 - HEAT ABSORBER FOR A SOLAR HEATING SYSTEM						
HALL	FREDERICK	F.	2452 VILLANEUVA WAY	MOUNTAIN VIEW	CA	94040
4126123 - SOLAR ENERGY COLLECTOR INCLUDING A WEIGHTLESS BALLOON WITH SUN TRACKING MEANS						

UNASSIGNED PATENTS (1/75-12-78) INVENTORS (ALPHA LISTING)

INVENTOR NAME	STREET	CITY	ST	ZIP/CNTRY
HARPER WILLIAM ANTHONY	7727 BASELINE RD.	BOULDER	CO	80303
4108160 - SOLAR WATER HEATING APPARATUS				
HASTWELL PETER J.	133 MILLS TERRACE	NORTH ADELAIDE, 5006		AU
4062351 - THERMAL PANEL FOR HEATING LIQUIDS				
HEDGER JOHN HENRY	1350 HILL ST.	EL CAJON	CA	92020
4063543 - SERVO TRACKING APPARATUS				
HEILEMANN VOLKMAN	127 MOUNTAINVIEW ROAD	WARREN TOWNSHIP	NJ	07060
3948247 - SOLAR HEAT-COLLECTOR DEVICE				
HEILEMANN VOLKMAR	127 MOUNTAIN VIEW ROAD	WARREN TOWNSHIP	NJ	07060
3991937 - SOLAR-HEATED UNIT				
4000851 - SOLAR-HEATED DWELLING				
HEIN LEOPOLD A.	RTE. 7	FAYETTEVILLE	TN	37334
4018212 - SOLAR HEATING AND COOKING APPARATUS				
HENDERSON ROLAND A.	RTE. 6, BOX 201	CHIPPEWA FALLS	WI	54729
4062489 - SOLAR-GEOTHERMAL HEAT SYSTEM				
HENDRIX ARNOLD P.	RTE. 1, BOX 775	ATOKA	TN	38004
4031702 - MEANS FOR ACTIVATING HYDRAULIC MOTORS				
HERBERT EDWARD	RTE. 44	CANTON	CT	06019
4050789 - TRACKING LENS SYSTEM FOR SOLAR COLLECTORS AND SKYLIGHTS				
HEYEN WILFRED L.	711 FLORIDA RD.	DURANGO	CO	81301
4119083 - SOLAR ENERGY ABSORBING BODY AND COLLECTOR				
HILLMAN EDWIN K.	907 W. DESERT COVE	PHOENIX	AZ	85029
4112920 - SOLAR LIQUID/AIR HEATER				
HINSON-RIDER GEORGE	300 CIRCLE DRIVE	SANTA FE	NM	87501
4051835 - SOLAR HEATING PIPE				
HIRSCHSOHN EPHRAIM	61 HASHOFTIM ST.	KIRYAT MOTZKIN		IL
4122832 - SOLAR COLLECTOR				
HOBBS .JAMES C. JR.	4384 INGRAHAM HIGHWAY	MIAMI	FL	33133
4048981 - SOLAR HEATER				
HOJNOWSKI EDWARD J.	112 LAGANA AVE.	PLANTSVILLE	CT	06479
3995615 - SOLAR HEAT COLLECTOR PANEL				
HOLT F. SHEPPARD	46 EMERSON ROAD	WINCHESTER	MA	01890
4058110 - WIDE ANGLE SOLAR HEAT COLLECTION SYSTEM				
HOPE HENRY F.	3192 HUNTINGDON RD.	HUNTINGDON VALLEY	PA	19006
4121764 - SOLAR HEATING SYSTEM				

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INVENTOR NAME			STREET	CITY	ST	ZIP/CNTRY
HORWITZ	LUDVIG	L.	ÄPELVÄGEN 25	S-182 75 STOCKSUND		SW
4055055 - THERMOSIPHONIC BOILER						
HOUSTON	ELMER		2437 NW. 11TH ST.	OKLAHOMA CITY	OK	73107
4066062 - SOLAR HEATING SYSTEM						
HUANG	BARNEY	K.	2008 VARNELL AVE.	RALEIGH	NC	27612
4069593 - SOLAR CURING AND DRYING STRUCTURE AND METHOD OF UTILIZING SOLAR ENERGY ASSOCIATED WITH AVAILABLE SOLAR RADIATION IN CURING AND DRY						
4109395 - GREENHOUSE, DRYING, STORING NURSERY SYSTEM						
HUANG	BARNEY	K.	5108 KAPLAN DR.	RALEIGH	NC	27606
3866334 - GREENHOUSE-BULK CURING AND DRYING SYSTEM						
HUMMEL	RICHARD	L.	87 BOULTON DR.	TORONTO		CA
4126270 - SOLAR ENERGY COLLECTION SYSTEM						
HURKETT	EARL	R.	311 W. PLATTE	FORT MORGAN	CO	80701
4011858 - SOLAR CONCENTRATOR						
HYSOM	ERVIN	E.	2307 HYACINTH	WICHITA	KS	67204
4085732 - METHOD AND APPARATUS FOR HEATING A LIQUID USING SOLAR ENERGY						
ILICH	DANIEL	F.	149-44 CHERRY AVE.	FLUSHING	NY	11355
4120284 - CLIP FOR CLINCHING A HEAT EXCHANGE CONDUIT WITH A SOLAR HEAT ABSORBER						
INGLEY	HERBERT	A.	5009 NW. 34TH TERRACE	GAINESVILLE	FL	32605
4023948 - SOLAR ENERGY REFRIGERATION AND AIR CONDITIONING SYSTEM						
ISFALT	ENGELBREKT		16 KINOSTUGATAN	STOCKHOLM		SE
4124062 - METHOD AND DEVICE FOR CONTROLLING THE TEMPERATURE IN A PREMISE						
JAHN	ARNOLD		1124 N. ELM ST.	FAIRMONT	MN	56031
3905352 - SYSTEM FOR COLLECTING AND TRANSFERRING USABLE SOLAR HEAT						
3998206 - SYSTEM FOR COLLECTING AND UTILIZING SOLAR ENERGY						
JARDINE	DOUGLAS	M.	4705 BRADY PLACE	COLORADO SPRINGS	CO	80915
4008709 - UNDERGROUND STORAGE SYSTEM FOR HEATING AND COOLING SYSTEMS						
JENSEN	JAMES	R.	RTE. 2, BOX 507	GOLDEN	CO	80401
4127103 - HEAT COLLECTING AND TRANSFERRING APPARATUS AND SYSTEMS ADAPTED FOR USE WITH SOLAR ENERGY						
JENSEN	JOHANNES	TEJLGAARD	NORASVEJ 11	DK-2920 CHARLOTTENL		DK
4047516 - PIPE JOINT FOR RADIATOR ELEMENT OF THIN MATERIAL						
JOHNSON	ARTHUR	F.	203 CREOLE LANE	FRANKLIN LAKES	NJ	07417
4054246 - BUILDING STRUCTURE FOR SOLAR ENERGY RECOVERY AND UTILIZATION						
JOHNSON	MELVIN	D.	6488 SOUTHWOOD DRIVE	LITTLETON	CO	80121
3965887 - METHOD OF HEATING A LIQUID AND SOLAR HEATING PANEL THEREFOR						
JOHNSTON	FRANKLIN	K. JR.	118 N. ALMANSOR	ALHAMBRA	CA	91801
4105042 - SOLAR HEATING METHOD AND APPARATUS						

UNASSIGNED PATENTS (1/75-12-78) INVENTDRS (ALPHA LISTING)

INVENTDR NAME				STREET	CITY	ST	ZIP/CNTRY
JDHNSTDN	JOHN	G.		33458 ANGELES FDREST HIGHWAY	PALMDALE	CA	93550
3875925 - SOLAR HEATER							
JONES	J.	PAUL	JR.	644 VALLEY VIEW LA.	WAYNE	PA	19087
4131110 - SOLAR ENERGY ABSORBER							
JDNES	RDBERT	L.		3410 TRUMAN	EL PASD	TX	79930
4055161 - SOLAR ENERGY CDLLECTOR AND SUN TRACKING CDNCENTRATDR							
KACHADORIAN	JAMES				RDYALTDN	VT	05068
4089142 - SOLAR-HEATED CDNCRETE SLAB BUILDING STRUCTURE							
4127973 - SDLAR-HEATED CDNCRETE SLAB BUILDING STRUCTURE							
KATZ	SDLLY			P.D. BDX 78036	SANDTDN		ZA
4128096 - SOLAR HEATERS							
KAY	THDMAS			6 CREEK RD.	GREAT NECK	NY	11023
4126014 - SDLAR CDLLECTDR PANEL AND REFRIGERATIDN SYSTEM DPERATED THEREBY							
KELLY	DONALD	F.		P.D. BDX 62215	SUNNYVALE	CA	94088
4090497 - SOLAR ENERGY SYSTEM							
KERLIN	ELIDT	E.		2310 PRIMRDSE	FDRT WDRTH	TX	75040
3916871 - FLAT PLATE SDLAR CDLLECTDR MDDULE							
KEYES	JDHN	HARDLD		141 ALPINE DRIVE	NEDERLAND	CD	80466
3987786 METHOD AND APPARATUS FDR CDLLECTING, STDRING AND TRANSMITTING SDLAR HEAT							
KLANK	BENND	E.		5639 JAY RD.	BDULDER	CD	80301
4127103 - HEAT CDLLECTING AND TRANSFERRING APPARATUS AND SYSTEMS ADAPTED FDR USE WITH SDLAR ENERGY							
KNEER	MANFRED	M.		P.D. BDX 152	ICARD	NC	28666
4090493 - SDLAR HEATER							
KNDDS	STELLAN			1746 MANZANITA PARK AVE.	MALIBU	CA	90265
4054124 - SDLAR RADIATIDN CDLLECTION SYSTEM							
KOTLARZ	JDSEPH	C.		109 W. WDDDLAWN DR.	MUNDELEIN	IL	60060
4092979 - CDMBINED SDLAR ENERGY CDNVERSIDN AND STRUCTURAL AND MECHANICAL BEAM AND STRUCTURES BUILT THEREFRDM							
KRAUS	EDMUND	J.		14160 REDHILL	TUSTIN	CA	92680
4055948 - SDLAR THERMAL-RADIATION, ABSDRPTIDN AND CDNVERSIDN SYSTEM							
KRAVITZ	JERDME	H.		12403 BRAXFIELD CT.	RDCKVILLE	MD	20952
4106952 - SDLAR PANEL UNIT							
KRESS	RDBERT	W.		27 MILL RDAD	LLDYD HARBDR	NY	11746
3949095 - SDLAR ENERGY PDOL HEATING APPARATUS							
KRUEGER	GEDRGE	R.		4120 N. 128TH ST.	BRODKFIELD	WI	53005
3990635 - WINDDW MDUNTED SDLAR HEATING UNIT							

UNASSIGNED PATENTS (1/75-12-78) INVENTORS (ALPHA LISTING)

INVENTOR NAME			STREET	CITY	ST	ZIP/CNTRY
KUMAR	ANIL		1301 HIGHWAY NO. 7	HOPKINS	MN	55343
4117830 - GANGABLE RADIANT ENERGY COLLECTOR						
KWAKE	JOHN	P.	2507 CAROB DRIVE	LOS ANGELES	CA	90046
4004380 - OOUBLE WALLED INFLATABLE STRUCTURES						
L'ESPERANCE	PAUL	M.	BOX 482, OAKWOOD LANE	VALLEY FORGE	PA	19481
4024852 - SOLAR ENERGY REFLECTOR-COLLECTOR						
LAING	NIKOLAUS		HOFENER WEG 35 BIS 37	7141 ALDINGEN NEAR S		DT
3893506 - DEVICE FOR THE ABSORPTION AND EMISSION OF HEAT						
3960205 - STORAGE BODY WITH LATENT STORAGE SUBSTANCES FOR TEMPERATURE EQUILIZATION						
4073284 - PROCESS AND DEVICE FOR UTILIZING METEOROLOGICAL RADIATIONS						
LAING	NIKOLAUS		HOFENER WEG 35-37	7141 ALDINGEN NEAR S		DT
4015583 - DEVICE FOR RECEIVING OR EMITTING RADIATION ENERGY						
LAIRD	GARY	W.	P.O. BOX 9013, 3231 TROUT RIVE	JACKSONVILLE	FL	32208
4013062 - SOLAR HEAT ABSORBER						
LANCIAULT	JOSEPH	A.	16 PRICHARO ST., APT. 710	FITCHBURG	MA	01420
3973553 - COMBINATION SOLAR HEAT COLLECTOR AND AWNING						
LANCIAULT	JOSEPH	A.	520 MAIN ST., APT. 508	FITCHBURGH	MA	01420
4098263 - SOLAR WATER HEATER FOR TRAILERS AND BUILDINGS						
LANG	ROGER		16, CHEMIN DE ROILBOT	CHAMBESY, GENEVA		CH
4112917 - SOLAR-RAY HEATING APPARATUS						
LARSON	ROLF	J.	36 RYDER AVE.	DIX HILLS	NY	11746
3949095 - SOLAR ENERGY POOL HEATING APPARATUS						
LAZZARA	SAMUEL	P.	12002 CHERRY ST.	LOS ALAMITOS	CA	90720
4079591 - SOLAR POWER PLANT						
LEITNER	LIONEL	J.	EGBERT HILL	MORRISTOWN	NJ	07960
4033326 - INFLATABLE SOLAR COLLECTOR FOR SWIMMING POOL						
LEVINE	RICHARD	S.	R.R. NO. 5, KIDVILLE LA.	LEXINGTON	KY	40511
4092978 - SOLAR ENERGY COLLECTOR						
LIEBI	HARALD		BOLGEN	ZWEISIMMEN, CANTON O		CH
4116221 - SOLAR ENERGY COLLECTING AND CONCENTRATING APPARATUS						
LIGHTFOOT	DANIEL	J.	415 N. MAIN ST.	SIGOURNEY	IA	52591
4003366 - SOLAR HEAT COLLECTOR MODULE						
LIN	KUO-CHUAN		NO. 10, LANE 177, PEI HSING ST	CHIA I, TAIWAN		CT
4010080 - SOLAR POWEREO DISTILLING OEVICE						
LOF	GEORGE	O.	4850 OLIVE ST.	DENVER	CO	80202
4061267 - SOLAR HEATING SYSTEM AND OPERATION THEREOF						

UNASSIGNED PATENTS (1/75-12-78) INVENTORS (ALPHA LISTING)

INVENTOR NAME	STREET	CITY	ST	ZIP/CNTRY
LONG ALFRED D.	C/O 1100 MONTREAL TRUST BLDG.,	VANCOUVER, B.C.		CA
4106482 - AUTONOMIC SOLAR PANEL				
LOVELACE ALAN M.		LA CANADA	CA	
4122833 - NON-TRACKING SOLAR ENERGY COLLECTOR SYSTEM				
LOWE WALLACE A.	P.O. BOX 1845	BRADENTON	FL	33506
4122829 - SOLAR ENERGY COLLECTOR				
LUDERITZ WILLY	WESTERBACHSTRASSER 27	LUBBECKE		DT
4089047 - TRIFOCAL MIRROR-REFLECTOR				
LUPKAS RAYMOND R.	54 MT. PLEASANT DR.	TRUMBULL	CT	06611
4116224 - SOLAR ENERGY COLLECTION DEVICE				
4117832 - SOLAR ENERGY COLLECTOR				
MADERN JEAN-PIERRE	ROUTE DE PERPIGNAN	66330 CABESTANY		FR
4037785 - COMBINATION SOLAR AND ELECTRIC HEATER				
MALECEK JAN	245 E. 77TH ST.	NEW YORK	NY	10021
4078547 - SOLAR HEATER AND CONDENSER				
MANELAS ARTHUR J.	38 MEADOW DR.	LOWELL	MA	01854
4080221 - SOLAR CELL ELECTRIC AND HEATING SYSTEM				
MANN HAROLD J. JR.	2120 PRIMROSE	FORT WORTH	TX	76111
4018213 - SOLAR HEATING STRUCTURE				
MANNISO JAMES L.	1605 AYRE ST.	NEWPORT	DE	19804
4055163 - SOLAR HEATING SYSTEM				
MANOR GIORA	19 KILMER ROAD	LARCHMONT	NY	10538
4017028 - TEMPERATURE DIFFERENTIAL SENSING AND CONTROL DEVICE				
MARCHESI CARLO M.	31 WINTER ST.	SAUGUS	MA	01906
4091622 - COMBINED DAY AND NIGHT SOLAR ENERGY SYSTEM				
MARTIN ROGER J.	1 ANNESLEY AVE.	TORONTO, ONTARIO		CA
4108019 - SOLAR TRACKING DEVICE				
MARTIN WILLIAM A.	804 VIA BELLA MARIA	SAN MARCOS	CA	92069
3901036 - TWO FLUID SOLAR BOILER				
MASON GEORGE F.	9 GENE ST.	EAST HAVEN	CT	06512
3997108 - AUTOMATIC AIR FLOW CONTROL				
MATLOCK PATRICIA	2123 S. PRIEST #216	TEMPE	AZ	85282
4109638 - SOLAR ENERGY CONVERTER CAROUSEL				
MATLOCK WILLIAM C.	2123 S. PRIEST	TEMPE	AZ	85282
4000734 - SOLAR ENERGY CONVERTER				

UNASSIGNED PATENTS (1/75-12-78) INVENTORS (ALPHA LISTING)

INVENTOR NAME	STREET	CITY	ST	ZIP/CNTRY
MATLOCK WILLIAM C.	2123 S. PRIEST #216	TEMPE	AZ	85282
4109638 - SOLAR ENERGY CONVERTER CAROUSEL				
MATTSON JOHN P.	123 LAKE SHORE DR.	DUXBURY	MA	02332
4077393 - SOLAR ENERGY HEAT COLLECTOR				
MATTSON JOHN P.	123 LAKE SHORE DRIVE	DUXBURY	MA	02332
4076015 - SOLAR ENERGY COLLECTOR				
MCCOLGAN JOHN M.	1623 ROSCOMARE RD.	LOS ANGELES	CA	90024
4082081 - PORTABLE LIGHT-WEIGHT SOLAR HEATER				
MCKEEN THOMAS RAY	2734 WILBORN DR.	SAN ANTONIO	TX	78217
4078549 - SOLAR ENERGY COLLECTOR				
MCRAE DUNCAN ROSS	1409 WIGMORE CT.	RALEIGH	NC	27609
4099517 - SOLAR ENERGY COLLECTOR				
MECKLER GERSHON	2750 RIDGE VALLEY	ATLANTA	GA	30326
4011731 - AIR CONDITIONING APPARATUS UTILIZING SOLAR ENERGY AND METHOD				
MECKLER GERSHON	7425 DEMOCRACY BLVD., UNIT 212	BETHESDA	MD	20034
4027653 - SOLAR ENERGY COLLECTOR				
MECKLER MILTON	16348 TUPPER ST.	SEPULVEDA	CA	91343
3996759 - ENVIRONMENT ASSISTED HYDRONIC HEAT PUMP SYSTEM				
4024908 - SOLAR POWERED HEAT RECLAMATION AIR CONDITIONING SYSTEM				
MEDICO JOHN J. JR.	5331 CAPE LEYTE DR., SIESTA KE	SARASOTA	FL	33581
3898979 - SOLAR HEAT COLLECTOR				
MEIER HAROLD K.	9620 ROYALTON DRIVE	BEVERLY HILLS	CA	90210
4056092 - FLAT PLATE SOLAR ENERGY COLLECTOR				
MEIER HERMAN JR.	BOX 31, R.D.	COXSACKIE	NY	12051
3987782 - SOLAR HEAT HOLDER				
MELCHIOR AUGUST S.	RTE. 4, BOX 156	WILSON	NC	27893
4051890 - DIRECTIONAL HEAT TRANSFER UNIT				
MEYER STANLEY A.	2931 BRYDEN ROAD	COLUMBUS	OH	43209
3970070 - SOLAR HEATING SYSTEM				
MEYER WARREN A.	612 COMANCHE ST., NE.	ALBUQUERQUE	NM	87107
4114594 - DEVICE FOR SYNCHRONOUSLY ROTATING SOLAR COLLECTORS				
MEYER WARREN A.	8612 BELLEHAVEN PL., N.E.	ALBUQUERQUE	NM	87112
4103672 - SOLAR COLLECTOR				
MILLER CHARLES G.		PASADENA	CA	
4051834 - PORTABLE, LINEAR-FOCUSED SOLAR THERMAL ENERGY COLLECTING SYSTEM				

UNASSIGNED PATENTS (1/75-12-78) INVENTORS (ALPHA LISTING)

INVENTDR NAME				STREET	CITY	ST	ZIP/CNTRY
MILLER	CHARLES	G.			PASADENA	CA	
4065053 - LDW CDST SDLAR ENERGY CDLLECTIDN SYSTEM							
4131336 - PRIMARY REFLECTDR FDR SDLAR ENERGY COLLECTIDN SYSTEMS							
MOLE	RDBERT	ALAN		230 39TH ST.	BDULDER	CO	80303
4020826 - SDLAR ENERGY SYSTEM							
MDRAWETZ	ERNST			REPSLAGAREVAGEN 10	STAFFANSTDRP		SW
4044949 - HEAT STDRAGE SYSTEM							
MORRISDN	CLAYTDN	A.		2716 NW. 4TH AVE.	GAINESVILLE	FL	32601
4023948 - SOLAR ENERGY REFRIGERATIDN AND AIR CDNDITIDNING SYSTEM							
MDRRISDN	RDBERT	PETER		PHEASANT RUN APTS.	HARLEYSVILLE	PA	19438
4062348 - PHDTDCHEMICAL THERMAL-ENERGY PRDCESS AND GENERATDR							
MDVICK	NYLE	DRLAND		4600 MACKY WAY	BDULDER	CD	80302
4116379 - HEATING APPARATUS							
MURPHY	JDHN	A.	JR.	7273 N. CENTRAL AVE.	PHDENIX	AZ	85020
4111188 - EXTRUDED METAL SOLAR CDLLECTDR RDDFING SHINGLE							
MYERS	WILLIAM	N.		4306B BOXWDDD CDURT	HUNTSVILLE	AL	35805
4018212 - SDLAR HEATING AND CDDKING APPARATUS							
NETHERTDN	OLIVER	E.		119 N. ARCTURAS AVE.	CLEARWATER	FL	33515
4102324 - SDLAR HEATING ASSEMBLY							
NICEWDNGER	DWIGHT	HARDLD		RTE. 1, BDX 495H	RAMDNA	CA	92065
4084575 - SDLAR HEATER UNIT							
NOBLE	HAVEN	D.		P.D. BDX 453	LEWISTDN	MN	55952
4124020 - APPARATUS FDR CDLLECTING SOLAR ENERGY							
NDRTHRUP	LEDNARD	L.	JR.	4312 WESTWAY	DALLAS	TX	75205
3991741 - RDDF-LENS SDLAR CDLLECTDR							
4022186 - CDMPDUND LENS SDLAR ENERGY SYSTEM							
O'BRIEN	PHILIP	F.		142 N. CARMELINA AVE.	LDS ANGELES	CA	90049
4082081 - PDRTABLE LIGHT-WEIGHT SDLAR HEATER							
D'HANLDN	EDWARD	J.		ASSEMBLY PDINT	LAKE GEDRGE	NY	12845
3964678 - SDLAR AIR CDNDITIONER							
4088119 - MEANS AND METHDDS DF PREVENTING THE LDSS OF SOLAR HEAT							
4089366 - MEANS AND METHODS FDR SENDING HEAT DDWNWARDLY							
O'HANLDN	EDWARD	J.		ASSEMBLY POINT	WARREN CDUNTY, LAKE	NY	12845
3986491 - SUMMER AND WINTER SDLAR HEAT CDLLECTDR							
O'NEILL	MARK	J.		11243 LANEWODD CIRCLE	DALLAS	TX	75218
3991741 - RDDF-LENS SDLAR CDLLECTDR							

UNASSIGNED PATENTS (1/75-12-78) INVENTORS (ALPHA LISTING)

INVENTOR NAME				STREET	CITY	ST	ZIP/CNTRY
OAKES	FRANCIS	W.	JR.	3911 TIVERTON ROAD	RANDALLSTOWN	MD	21133
3985119 - SOLAR HEAT COLLECTOR							
OLINGER	KEITH	O.		P.O. BOX 2031	DURANGO	CO	81301
4119083 - SOLAR ENERGY ABSORBING BODY AND COLLECTOR							
OLSEN	JAMES	PERCIVAL		829 BON ACCORD ST.	FERGUS, ONTARIO		CA
4121568 - SOLAR PANEL FLAT PLATE COLLECTOR							
ORRISON	WILLIAM	W.		100 AYLESBURY HILL	SAN ANTONIO	TX	78209
4038972 - SOLAR ENERGY COLLECTOR APPARATUS							
OSBORNE	RAYMOND			50 LAKE DR.	HAMSWORTHY, POOLE, D		EN
3908666 - SUN BATH							
PARHAM	J.	P.		R.R. 2, BOX 475	MELBOURNE	FL	32901
4031879 - SOLAR ENERGY CONVERSION PLANT							
PARKER	ALFRED	B.		2937 SW. 27TH AVE.	MIAMI	FL	33133
3998205 - SOLAR REACTOR STEAM GENERATOR METHOD AND APPARATUS							
4055165 - CARBONACEOUS BOILER							
PARKER	LOUIS	W.		2040 N. DIXIE HIGHWAY	FORT LAUDERDALE	FL	33305
4076025 - SOLAR STEAM BOILER							
PARKER	LOUIS	W.		2408 SUNRISE KEY BLVD.	FORT LAUDERDALE	FL	33304
3919998 - CONVECTION-TYPE SOLAR HEATING UNIT							
PASTOR	JOSE			191 WILTON RD.	WESTPORT	CT	06880
4088116 - RADIANT ENERGY COLLECTOR							
PAULY	LOU	A.		3598 CROCKER ROAD	EUGENE	OR	97407
3993528 - METHOD OF CONSTRUCTING SOLAR FURNACE							
PAULY	LOU	ALLEN		C/O NELS WELCH 25568 WOLF CREE	VENETA	OR	97487
4000733 - SOLAR FURNACE							
PAVLAK	ALEX			JUG HOLLOW ROAD	PHOENIXVILLE	PA	19460
4024852 - SOLAR ENERGY REFLECTOR-COLLECTOR							
PAZ	CARLOS	FERNANDEZ		JUAN XXIII	15-HUESCA		ES
3991769 - RADIATION CONCENTRATOR DEVICE FOR MEDICAL-AESTHETICAL USE							
PAZ	ELDAD			9 HAYSUR ST.	RAMAT HASHARON		IL
4103675 - SOLAR COLLECTORS							
PEDERSEN	DAVID	WILLIAM		P.O. BOX 1241	TELLURIDE	CO	81435
4014313 - APPARATUS AND METHOD FOR COLLECTING SOLAR ENERGY AT AN UPRIGHT SURFACE							
PELEHACH	MICHAEL			22 GINA DRIVE	CENTERPORT	NY	11721
3949095 - SOLAR ENERGY POOL HEATING APPARATUS							

UNASSIGNED PATENTS (1/75-12-78) INVENTORS (ALPHA LISTING)

INVENTOR NAME			STREET	CITY	ST	ZIP/CNTRY
PERKINS	GERALD	S.		ALTADENA	CA	
4111184 - SUN TRACKING SOLAR ENERGY COLLECTOR						
PETERSEN	ROSS	K.	2974 W. RIVER ROAD	MINNEAPOLIS	MN	55406
3965972 - HEATING AND COOLING SYSTEM						
PHILLIPS	MAURICE	E.	182 DELLENBERGER AVE.	AKRON	OH	44312
4076016 - APPARATUS FOR THE UTILIZATION OF SOLAR HEAT						
PICKETT	JOHN		1232 ZACCHINI AVE.	SARASOTA	FL	33577
3970069 - SOLAR HEATER/COOLER ASSEMBLY						
PIES	OTHMAR	W.	7041 VINE ST.	CINCINNATI	OH	45216
4095584 - SOLAR HEATING SYSTEM						
PITTINGER	A.	LINCOLN	62 COLONIA MIRAMONTE	SCOTTSDALE	AZ	85253
3994278 - ENERGY ROOF						
4082080 - ENERGY ROOF						
PITTS	CLYDE	T.	13608 DONWARD COURT	TAMPA	FL	33612
4023948 - SOLAR ENERGY REFRIGERATION AND AIR CONDITIONING SYSTEM						
POHL	JENS	G.		SAN LUIS OBISPO	CA	
4051834 - PORTABLE, LINEAR-FOCUSED SOLAR THERMAL ENERGY COLLECTING SYSTEM						
POLLEY	JOSEPH	A.	P.O. BOX 361	MASSAPEQUA	NY	11758
4106485 - SOLAR ENERGY REFLECTING SYSTEM						
POPOVICH	JOHN	MICHAEL	9620 ROYALTON DRIVE	BEVERLY HILLS	CA	90210
4056092 - FLAT PLATE SOLAR ENERGY COLLECTOR						
PORTER	CLIFFORD		13 PT. ELEANORA'S LA.	CRESTWOOD	NY	10707
4125108 - PANELS FOR SOLAR HEATING SYSTEM						
PORTER	CLIFFORD		13 ST. ELEANORA'S LANE	CRESTWOOD	NY	10707
4037583 - SOLAR HEATING SYSTEM AND PANELS						
POSNANSKY	MARIO		PAPPELWEG 4,	3072 OSTERMUNDIGEN		CH
4074678 - METHOD AND APPARATUS FOR HEATING A FLUID MEDIUM BY MEANS OF SOLAR ENERGY						
POSNANSKY	MARIO		PAPPELWEG 4	3072 OSTERMUNDIGEN (		CH
4095369 - INSTALLATION FOR CULTIVATING PLANT CULTURES						
4099514 - METHOD AND APPARATUS FOR HEATING A FLUID MEDIUM BY MEANS OF SOLAR ENERGY						
POWELL	CHARLES	E.	15510 TONEKAI RD., APT. F	APPLE VALLEY	CA	92037
4088115 - SOLAR HEATING SYSTEM						
POWELL	HAYWARD		3180 CARLIN AVE.	LYNWOOD	CA	90262
3987783 - SOLAR HEATING PANEL						
POWELL	ROGER	ANDREW	1455 WHITWOOD DR.	NORRISTOWN	PA	19401
4119365 - TROUGH REFLECTOR						

UNASSIGNED PATENTS (1/75-12-78) INVENTORS (ALPHA LISTING)

INVENTOR NAME			STREET	CITY	ST	ZIP/CNTRY
POWELL	WILLIAM	R.	10403 MAY WIND COURT	COLUMBIA	MO	21044
4033118 - MASS FLOW SOLAR ENERGY RECEIVER						
PRAGER	MELVIN		619 NE. 28TH ST.	FT. LAUDERDALE	FL	33334
4125946 - APPARATUS FOR DRYING CLOTHES USING SOLAR ENERGY						
PRESS	JACK	J.	17426 PLAZA DESTACADO	SAN DIEGO	CA	92128
4036209 - ATMOSPHERIC HEAT EXCHANGE METHOD AND APPARATUS						
PULVER	DONALD	W.	ONE OLIVER PLAZA	PITTSBURGH	PA	15222
3935897 - METHOD OF SOLAR HEATING AND COOLING						
PULVER	DONALD	W.	1616 TROLIST DRIVE	PITTSBURGH	PA	15241
3994276 - METHOD OF SOLAR HEATING SO AS TO REDUCE OIL AND GAS CONSUMPTION						
PUPPOLO	HENRY	FRANCIS	218 CORINTH ST.	NORTH ADAMS	MA	01247
4083490 - SOLAR SUPPLEMENTAL HEATING SYSTEM						
PYLE	DONALD	L.	810 ILLINI DR.	PONTIAC	IL	61764
3902474 - SOLAR HEAT CONVERTER						
QUICK	MELVIN	RANDOLPH	889 RIFFLE AVE.	RAHWAY	NJ	07090
3996918 - SOLAR ENERGY COLLECTOR UNIT						
RADEBOLD	REINHART		QUASTENHORNWEG 14A	1 BERLIN 22		DT
4002158 - SUPPORT STRUCTURE FOR SOLAR ENERGY CONVERTER						
RADENKOVIC	LJUBOMIR		P.O. BOX 3068	KANO		NG
4121566 - SONIA SYSTEM						
RAIMANN	BERNARDO		HEGIBERGSTRASSE 78	4632 TRIMBACH (CANTO		CH
4095369 - INSTALLATION FOR CULTIVATING PLANT CULTURES						
RAMEY	HARRY	B.	BOX 272, RTE. 5	BEREA	KY	40403
4026270 - COMBINATION HEAT ABSORBER AND HEAT STORAGE SYSTEM						
RAMEY	HARRY	BORDERS	RTE. 5, BOX 272	BEREA	KY	40403
3991938 - COMBINATION HEAT PUMP AND LOW TEMPERATURE SOLAR HEAT ABSORBER						
4005583 - COMBINATION HEAT PUMP AND LOW TEMPERATURE SOLAR HEAT COLLECTOR						
RAND	J.	PATRICK	2357 ONYX ST.	EUGENE	OR	97403
4031674 - INFLATABLE TENT						
RAPPA	BENNY	F.	5 SEAWAY DRIVE	NEW PORT RICHEY	FL	33552
4038970 - SOLAR WATER HEATER						
RAPPOPORT	MARC	D.	P.O. BOX 10445	PORTLAND	OR	97210
4099381 - GEOTHERMAL AND SOLAR INTEGRATED ENERGY TRANSPORT AND CONVERSION SYSTEM						
RASER	WILLIAM	H.	6451 W. 83RD ST.	LOS ANGELES	CA	90045
3872854 - SUNLIGHT CONCENTRATOR FOR ENERGY CONVERSION						

UNASSIGNED PATENTS (1/75-12-78) INVENTORS (ALPHA LISTING)

INVENTOR NAME	STREET	CITY	ST	ZIP/CNTRY
RATHBUN KENNETH R.	P.O. BOX 12637	AUSTIN	TX	78711
4095118 - SOLAR-MHD ENERGY CONVERSION SYSTEM				
REED GERALD C.	14544 LANGHILL	HACIENDA HEIGHTS	CA	91745
4062350 - SOLAR WATER HEATER				
REINES ROBERT G.	STAR RTE. 103	TIJERAS	NM	87059
3949732 - SOLAR HEATED BUILDING				
RESTLE JOSEPH W.	4630 N. 109TH ST.	WAUWATOSA	WI	53225
3990635 - WINDOW MOUNTED SOLAR HEATING UNIT				
RHODES WILLIAM A.	4421 N. 13TH PL.	PHOENIX	AZ	85014
4084577 - SOLAR RADIATION CONVERTING METHOD AND MEANS				
4122827 - KINEMATIC SYNCHRONOUS SOLAR HELIOSTAT				
RICE HAROLD D.	25TH AND MCGEE TRAFFICWAY	KANSAS CITY	MO	64141
4011857 - SOLAR ENERGY CONVERTER AND ELONGATED FRESNEL LENS ELEMENT				
RINEER ARTHUR E.	P.O. BOX 115	BEULAH	MI	49617
3915147 - SOLAR ENERGY STEAM GENERATOR				
ROARK CHARLES FREDERICK	24 MAPLE LA.	BROWNSBURG	IN	46112
4084580 - COMBINATION SOLAR COLLECTOR AND HEAT EXCHANGER				
ROBARTS DONALD E.	1311 - 32ND ST. WEST	BRANDENTON	FL	33505
4122829 - SOLAR ENERGY COLLECTOR				
ROBBINS ROLAND W. JR.	825 E. CALIFORNIA BLVD.	RIDGECREST	CA	93555
4027651 - SOLAR-ENERGY-POWERED SUN TRACKER				
ROBERTS CHARLES C. JR.	27 W. 776 GREENVIEW	WARRENVILLE	IL	60555
4099556 - VARIABLE THERMAL CONDUCTANCE REFLUX HEAT PIPE				
ROBERTS MARVIN A.	6225 MELVIN AVE.	RESEDA	CA	91335
4022187 - FLOATING SOLAR HEATER FOR SWIMMING POOLS				
ROBERTSON HARRY S.	4722 ALHAMBRA CIRCLE	CORAL GABLES	FL	33146
3990430 - SOLAR ENERGY COLLECTOR SYSTEM				
ROGERS BRUCE C.	915 GEORGETOWN ROAD	SALEM	OH	44460
3929121 - SOLAR HEAT COLLECTOR				
ROGERS RAMONA	4708 MEADOW LA.	SIOUX CITY	IA	51104
4106479 - SOLAR HEAT COLLECTOR				
ROM FRANK E.	171 BELMAR BLVD.	AVON LAKE	OH	44012
3908631 - METHOD AND APPARATUS FOR CONVERTING SOLAR RADIATION TO HEAT ENERGY				
ROSELL AXEL	4 UPPFARTSVAGEN	SALTSJO-BOO		SE
4124062 - METHOD AND DEVICE FOR CONTROLLING THE TEMPERATURE IN A PREMISE				

UNASSIGNEO PATENTS (1/75-12-78) INVENTORS (ALPHA LISTING)

INVENTOR NAME			STREET	CITY	ST	ZIP/CNTRY
ROSS	DONALD	K.	NO. 9 CROSSWINOS	ST. LOUIS COUNTY	MO	63132
4111186 - FLAT PLATE SOLAR COLLECTOR						
ROWEKAMP	RICHARO	J.	3626 GLENMORE AVE.	CINCINNATI	OH	45211
3886998 - COMBINATION SOLAR WATER HEATER ANO CHILLER						
RUFF	JOHN	O.	206 BIRCH ST.	ALEXANDRIA	VA	22305
3960322 - SOLAR HEAT PUMP						
RUFF	JOHN	OENIS	206 BIRCH ST.	ALEXANORIA	VA	22305
4018581 - SOLAR HEATING SYSTEM						
RUGENSTEIN	ROBERT	W.	RTE. 2, BOX 251	INMAN	SC	29349
4049195 - SOLAR HEATEO BUILOING STRUCTURE						
RUST	RUOOLPH		4562 HEIL, APT. 3	HUNTINGTON BEACH	CA	92649
4040411 - APPARATUS FOR CONCENTRATION OF SOLAR RADIATION						
SAFDARI	YAHYA	B.	610 E. CENTER	EUREKA	IL	61530
4019494 - SOLAR AIR HEATER ASSEMBLY						
SALLEN	LEROY	H.	225 COUNTRY CLUB ORIVE	LARGO	FL	33540
3985117 - SOLAR SENSOR-HEATER						
SAMPSON	ARTHUR	R.	4 GRANOVIEW OR.	FRANKLIN	MA	02038
4114809 - WINO POWERED HYORAULIC HEATING SYSTEM						
SANOSTROM	WAYNE	R.	BOX 2414	FAIRBANKS	AK	99707
4080955 - PORTABLE SOLAR ENERGY COLLECTOR						
SAUNOERS	NORMAN	B.	15 ELLIS RO.	WESTON	MA	02193
4078603 - SOLAR COLLECTOR ANO HEATING ANO COOLING SYSTEM						
4123002 - HEATING ANO VENTILATION SYSTEM						
4129120 - HEATING ANO VENTILATION SYSTEM						
SAUNOERS	NORMAN	B.	15 ELLIS ROAO	WESTON	MA	02193
3952947 - HEATING AND VENTILATION SYSTEM						
4018214 - HEATING ANO VENTILATION SYSTEM						
SAVAGE	FREO	L.	#47 - 3987 GOROON HEAO RD.	VICTORIA, B.C.		CA
4106482 - AUTONOMIC SOLAR PANEL						
SAYPALIA	WILLIAM	E. JR.	143 ROCKVILLE RO.	BROAD BROOK	CT	06016
3910490 - SOLAR ENERGY HEAT AND COOLING SYSTEM						
SCHIOLER	HOLGER		ROOE HUS, HOJBJERGVEJ 17	DK-4171 JYSTRUP		OK
4047516 - PIPE JOINT FOR RADIATOR ELEMENT OF THIN MATERIAL						
SCHLESINGER	ROBERT	J.	5108 MELVIN AVE.	TARZANA	CA	91356
3986489 - SOLAR ENERGY TRANSFER SYSTEM WITH PROTECTION AGAINST FREEZING						
SCHLESINGER	ROBERT	J.	15150 RAYMERS	VAN NUYS	CA	91405
4064867 - SOLAR HEAT COLLECTOR						

UNASSIGNED PATENTS (1/75-12-78) INVENTORS (ALPHA LISTING)

INVENTOR NAME	STREET	CITY	ST	ZIP/CNTRY
SCHMITT EDWARD A.	690 WYLESWOOD DR.	BEREA	OH	44017
3894369 - BUILDING STRUCTURES				
SCHRIEFER ARNO H. JR.	R.R. 1	DEWEY	IL	61840
4073282 - SOLAR PANEL				
SCOTT WILLIAM J.	2013 HEATHER DR.	MONTEREY PARK	CA	91754
4083358 - SOLAR REFLECTOR COLLECTOR				
SCRAGG ROBERT L.	2937 SW. 27TH AVE.	MIAMI	FL	33133
3998205 - SOLAR REACTOR STEAM GENERATOR METHOD AND APPARATUS				
4055165 - CARBONACEOUS BOILER				
SCULLEY THOMAS M.	126 GULF HIGHLANDS DRIVE	PORT RICHEY	FL	33568
4038970 - SOLAR WATER HEATER				
SELCUK M. KUDRET		LA CANADA	CA	
4044753 - SOLAR ENERGY COLLECTION SYSTEM				
4122833 - NON-TRACKING SOLAR ENERGY COLLECTOR SYSTEM				
SELCUK M. KUDRET		LACANADA	CA	
4091798 - NON-TRACKING SOLAR ENERGY COLLECTOR SYSTEM				
SHELTON HERBERT P.	4832 MARTIN ST.	ALEXANDRIA	VA	22312
4028008 - SOLAR ENERGY OPERATED AIR COMPRESSOR				
SHUBERT NICK J.	893 E. INDIANOLA AVE.	YOUNGSTOWN	OH	44502
4084573 - PYRAMIDAL SOLAR HEATER				
SMITH ARTHUR V. JR.	6525 INDEPENDENCE ST.	ARVADA	CO	80004
4102329 - SYSTEM FOR COLLECTING SOLAR ENERGY				
SMITH FREDERICK A.	807-1246 HARO ST.	VANCOUVER, BRITISH C		CA
4083359 - SOLAR HEATER UNITS				
SMITH GERALD W.	1605 AYRE ST.	NEWPORT	DE	19804
4055163 - SOLAR HEATING SYSTEM				
SMITH LYNWOOD L.	2915 PINK HILL RD.	KINSTON	NC	28501
4109640 - SOLAR HEATING SYSTEM				
SMITH OTTO J.	612 EUCLID AVE.	BERKELEY	CA	94708
4117682 - SOLAR COLLECTOR SYSTEM				
SMITH PHILIP D.	385 CAMELBACK ROAD	PLEASANT HILL	CA	94523
4030477 - SOLAR COLLECTOR WITH CONICAL ELEMENTS				
4038969 - SOLAR ENERGY COLLECTOR				
SMITH RICHARD H.	30 BATER RD.	HILLSBOROUGH	CA	94010
3893443 - FLOATING SOLAR POOL HEATER				
SOMLO PATRICIA K.	2045 E. BROADWAY	TEMPE	AZ	85282
4000734 - SOLAR ENERGY CONVERTER				

UNASSIGNED PATENTS (1/75-12-78) INVENTORS (ALPHA LISTING)

INVENTOR NAME			STREET	CITY	ST	ZIP/CNTRY
SOMMER	WARREN	T.	2608 N. HUMBOLDT BLVD.	MILWAUKEE	WI	53212
4102326 - CENTRAL RECEIVER SOLAR COLLECTOR USING MECHANICALLY LINKED MIRRORS						
SORENSON	EDWARD	FREDRICK	998 BARRETT	CHULA VISTA	CA	92011
4094301 - SOLAR COLLECTOR PANEL						
ST. CLAIR	JOHN	C.	BOX 216, R.R. 5	LONDON	OH	43140
3981151 - USE OF SOLAR ENERGY HEAT GATHERING AND STORING SYSTEMS TO INCREASE FARM CROP YIELDS						
STEFFEN	SYLVESTER	L.	R.R. 3	NEW HAMPTON	IA	50695
4020565 - DRAFT INDUCING ROOF FOR STORAGE STRUCTURES						
4045880 - SOLAR GRAIN DRYING APPARATUS						
STELZER	WILLIAM		1354 BLUE HERON DRIVE	MILFORD	MI	48042
4026269 - SOLAR HEATING SYSTEMS						
4051832 - SOLAR HEATING PANEL						
STEPHENS	JAMES	B.		LA CRESCENTA	CA	
4065053 - LOW COST SOLAR ENERGY COLLECTION SYSTEM						
4131336 - PRIMARY REFLECTOR FOR SOLAR ENERGY COLLECTION SYSTEMS						
STEPHENS	JAMES	W.	1681 TILLING WAY	STONE MOUNTAIN	GA	30082
4114599 - SOLAR COLLECTOR						
STEPHENSON	RONALD	BART	5115 CASA RICA	SAN ANTONIO	TX	78233
4078549 - SOLAR ENERGY COLLECTOR						
STIFF	JOHN	E.	3111 S. VALLEY VIEW	LAS VEGAS	NV	89102
4102328 - SOLAR HEATING AND CONTROL SYSTEM						
STOUT	BRIAN		2 BRASTOW AVE.	SOMERVILLE	MA	02134
3918430 - SOLAR HEATING SYSTEM AND COMPONENTS THEREOF						
4038967 - SOLAR HEATING SYSTEM AND COMPONENTS THEREOF						
STOUT	HARRY	E.	2 BRASTOW AVE.	SOMERVILLE	MA	02134
3918430 - SOLAR HEATING SYSTEM AND COMPONENTS THEREOF						
4038967 - SOLAR HEATING SYSTEM AND COMPONENTS THEREOF						
STRAND	LYLE	L.	2606 FREMONT ST.	MARSHALLTOWN	IA	50158
4069809 - SOLAR HEAT COLLECTING POROUS BUILDING BLOCKS						
STRICKLAND	CHARLES	IRVIN	1ST AND BRIDGE STS.	NEDERLAND	CO	80466
3987786 - METHOD AND APPARATUS FOR COLLECTING, STORING AND TRANSMITTING SOLAR HEAT						
STRONG	JOHN	D.	136 GRAY ST.	AMHERST	MA	01002
4029081 - SOLAR ENERGY TRANSPORT SYSTEM						
4098019 - SOIL PASTEURIZING APPARATUS						
SUGA	NAGAICHI		NO. 2, TOYAMACHO	SHINJUKU-KU, TOKYO		JA
3889531 - WEATHERING TEST APPARATUS						
SWANN	FREDERICK	R.	5913 N. BENO RD.	ASHTABULA	OH	44004
4111185 - SOLAR HEATING SYSTEM						

UNASSIGNED PATENTS (1/75-12-78) INVENTORS (ALPHA LISTING)

INVENTOR NAME			STREET	CITY	ST	ZIP/CNTRY
SWANSON	DAVID	A.	1217 W. 4TH ST.	TEMPE	AZ	85281
4069971 - SOLAR AIR CONDITIONING SYSTEM						
SWITZGABLE	HAROLD		P.O. BOX 171	MONMOUTH JUNCTION	NJ	08852
3991936 - HEAT TRANSFER SYSTEM						
TABOR	HARRY	ZVI	13 HAMEYASOIM STREET	JERUSALEM		IL
4069810 - VACUUM SOLAR COLLECTORS						
4069811 - SOLAR COLLECTORS						
TACCHI	VICTORIO		RIOJA 50, 1(DEGREES)PISO DPTO.	CORDOBA		AR
4110986 - SYSTEMS FOR MAKING USE OF THE ENERGY CARRIED BY A FLUID AND SUPPLIED THERETO BY SOLAR ENERGY						
TAYLOR	MAX	F.	RTE. 1	WHITEWATER	WI	53190
4016861 - SOLAR HEATING SYSTEM						
TCHERNEV	DIMITER	I.	9 WOODMAN ROAD	CHESTNUT HILL	MA	02167
4034569 - SORPTION SYSTEM FOR LOW-GRADE (SOLAR) HEAT UTILIZATION						
TEETER	EARL	BANGLE JR.	1216 CRESCENT AVE.	GASTONIA	NC	28052
3897820 - WALL PANEL STRUCTURE						
THIEL	HEINZ	E.	468 WILLIS DRIVE	OAKVILLE, ONTARIO		CA
4031881 - SOLAR HEATER						
THOMASON	HARRY	E.	609 CEDAR AVE. (FORT WASHINGTO	WASHINGTON	DC	20022
4029082 - HEAT AND COLD STORAGE APPARATUS						
THOMASON	HARRY	E.	6802 WALKER HILL ROAD, SE.	WASHINGTON	DC	20027
3980130 - HEAT, COLD AND DRY STORAGE						
THOMASON	HARRY	E.	6802 WALKER MILL RD., SE.	WASHINGTON	DC	20027
4102327 - SOLAR HEATING (COOLING) SYSTEM						
THOMASON	HARRY	E.	6802 WALKER MILL ROAD, S.E.	WASHINGTON	DC	20027
3910253 - FLAT ROOF SOLAR HEATED BUILDING						
THOMASON	HARRY	E.	6802 WALKER MILL ROAD, SE.	WASHINGTON	DC	20027
3989031 - SOLAR HEAT COLLECTOR						
THOMASON	HARRY	E.	609 CEDAR AVE.	FORT WASHINGTON	MD	20022
4082143 - SOLAR ENERGY						
THOMASON	HARRY	EMMITTE	6802 WALKER MILL ROAD, SE.	WASHINGTON	DC	20027
3965696 - CROP DRYING (FOOD PRESERVING) APPARATUS						
3983929 - HEAT OR COLD AND DRY STORAGE						
THOMASON	HARRY	JACK JR.	609 CEDAR AVE. (FORT WASHINGTO	WASHINGTON	DC	20022
4029082 - HEAT AND COLD STORAGE APPARATUS						
THOMASON	HARRY	JACK JR.	6802 WALKER HILL ROAD, SE.	WASHINGTON	DC	20027
3980130 - HEAT, COLD AND DRY STORAGE						

UNASSIGNEO PATENTS (1/75-12-78) INVENTORS (ALPHA LISTING)

INVENTOR NAME				STREET	CITY	ST	ZIP/CNTRY
THOMASON	HARRY	JACK	JR.	6802 WALKER MILL ROAD, S.E.	WASHINGTON	OC	20027
3910253 - FLAT ROOF SOLAR HEATEO BUILDING							
THOMASON	HARRY	JACK	JR.	6802 WALKER MILL ROAO, SE.	WASHINGTON	DC	20027
3983929 - HEAT OR COLD ANO ORY STORAGE							
3989031 - SOLAR HEAT COLLECTOR							
TICE	VERNON	LAWTON		2 OLNEY MILL COURT	OLNEY	MO	20832
4049194 - FIREPLACE/FORCEO AIR FURNACE HEAT GENERATION ANO OISTRIBUTION SYSTEM							
TOMCHAK	SIGFRIO	A.		16896 LOLO CIR.	FOUNTAIN VALLEY	CA	92708
4085728 - SOLAR ENERGY HEATER							
TONN	MARTIN	H.			AMBOY	MN	56010
3919784 - SOLAR PRE-HEAT CHAMBER FOR GRAIN ORYERS							
TONN	MARTIN	H.		RTE. NO. 1	AMBOY	MN	56010
3979838 - FAN MOTOR SAFETY FEATURE FOR GRAIN ORYING SYSTEM							
TSAY	YAW	JENN		NO. 10, LANE 177. PEI HSING ST	CHIA I, TAIWAN		CT
4010080 - SOLAR POWERED OISTILLING OEVICE							
URBAN	WILLIAM	C.		2765 GLEN MAWR ROAO	JACKSONVILLE	FL	32207
3969829 - OEHYORATION							
VAN KUIJK	JOSEPHUS	PETRUS		CHEMIN OES VIGNES 85	1814 LA TOUR OE PEIL		CH
4106481 - APPARATUS FOR RECOVERING SOLAR ENERGY							
VAN LEEUWEN	EGON			35 RICHMONO ST.	BLACKBURN, VICTORIA		AU
4114598 - SOLAR HEATER ANO ELEMENT THEREFOR							
VANOAMENT	DANIEL	O.		527 FAIRVIEW AVE.	MILL VALLEY	CA	94941
4051833 - REINFORCEO STRUCTURAL PANEL WITH INTEGRAL SOLAR ENERGY COLLECTING ARRAY AND METHOO OF PRODUCING ANO ASSEMBLING SAME							
VASILANTONE	MICHAEL			34 COLUMBIA RO.	SOMERVILLE	NJ	08876
4116223 - SOLAR ENERGY UNIT							
VIGOUREUX	FRANCIS	E.		RESIOENCE LA GRANOE CANOELLE-A	MARSEILLE		FR
4084581 - APPARATUS FOR FOCUSING AND USING SOLAR ENERGY							
VOELKER	PERCY			455 GRANT AVE.	BROOKLYN	NY	11208
4079726 - SYSTEM FOR STORAGE AND USE OF SOLAR ENERGY							
4094299 - HELIOTHERMOOYNAMIC SYSTEM							
VON HARTITZSCH	PETER			409 JERVOIS STREET	HASTINGS		NZ
4022185 - HEAT ACTUABLE DIRECTING OEVICE							
WAOE	GLENN	C.		313 HIGHLAND	PARAGOULD	AR	72450
4128204 - INHABITABLE ENCLOSURE ANO METHODS RELATING THERETO							
WALORIP	RALPH	L.		8005 STILLBROOKE	MANASSAS	VA	22110
4034735 - SOLAR ENERGY SYSTEM							

UNASSIGNED PATENTS (1/75-12-78) INVENTORS (ALPHA LISTING)

INVENTOR NAME	STREET	CITY	ST	ZIP/CNTRY
WALKER JAMES EDWIN 4033325 - FLUID SHEET SOLAR COLLECTOR	RTE. 5, BOX 150	CHARLOTTESVILLE	VA	22901
WARREN GLENN B. 4069674 - POWER PLANT	1361 MYRON ST.	SCHENECTADY	NY	12309
WASSERMAN KURT J. 4067319 - SOLAR ENERGY CONVERTING APPARATUS	SCHEFFLERS ROAD	WESTTOWN	NY	10998
WATT RICHARD E. 4127105 - ISOTHERMAL PROCESS SOLAR COLLECTOR PANEL	6384 ROCKHURST DR.	SAN DIEGO	CA	92120
WATT RICHARD EDWIN 4098261 - FLAT PLATE SOLAR COLLECTOR PANEL HAVING EXTRUDED THERMAL CONDUCTORS	6384 ROCKHURST DR.	SAN DIEGO	CA	92120
WAY LEE V. JR. 4077391 - PORTABLE SOLAR COOKER AND THE SOLAR PANEL USED THEREIN	RTE. 3, BOX 333C	WILMINGTON	NC	
WEIR RICHARD LLOYD 4085731 - SOLAR ENERGY CONVERSION SYSTEM	75 SINCLAIR AVE.	DAYTON	OH	45405
WEISS GUNTHER 4080954 - SOLAR COLLECTOR APPARATUS	2025 S. W. BRIGGS CT.	BEAVERTON	OR	97005
WELCH MARTIN JEFFREY 4083490 - SOLAR SUPPLEMENTAL HEATING SYSTEM	16 UNDERWOOD DR.	SARATOGA	NY	12866
WERNER FRANK D. 4024910 - ROCK CHANNEL HEAT STORAGE	BOX SR9	JACKSON	WY	83001
WHEELER PHILLIP R. 3960322 - SOLAR HEAT PUMP	209 PINE ST.	ALEXANDRIA	VA	22305
WHEELER PHILLIP ROOD 4018581 - SOLAR HEATING SYSTEM	209 PINE ST.	ALEXANDRIA	VA	22305
WIKHOLM ILMAR VEIKKO 4003367 - STORAGE TYPE SOLAR WATER HEATER	R.R. 2	WHITBY, ONTARIO		CA
WILLIAMS SALVION ED 4100914 - SOLAR ENERGY COLLECTOR	6531 S. ATCHINSON WY.	ENGLEWOOD	CO	80110
WILSON MELVIN A. 4061129 - SOLAR FURNACE HEATING SYSTEM	RTE. 1, BOX 514	STEVENSVILLE	MD	21666
WINSTON THEODORE 4123003 - SOLAR ENERGY COLLECTION PANELS AND ENERGY RECOVERY SYSTEMS	643 STANFORD RD.	BURBANK	CA	91504
WIQUEL ATTILIO-WILLIAM 4076014 - SOLAR CIGARETTE LIGHTER	C/O MONACO GOVERNMENT TOURIST	NEW YORK	NY	10021
WOODWORTH ROBERT N. 4103673 - NON-TRACKING SOLAR ENERGY CONCENTRATOR	2838 GRAYSBY ST.	SAN PEDRO	CA	90732

UNASSIGNED PATENTS (1/75-12-78) INVENTDRS (ALPHA LISTING)

INVENTDR NAME	STREET	CITY	ST	ZIP/CNTRY
WORTHINGTDN MARK N.	10227 WHITE MOUNTAIN RDAD	SUN CITY	AZ	85351
4049046 - SDLAR HEATING/CDOLING SYSTEM				
4068652 - MULTI-PURPDSE SOLAR COLLECTOR/HEAT EXCHANGER				
WORTHINGTON MARK N.	10227 WHITE MTN. RD.	SUN CITY	AZ	85351
4128124 - MULTI-MODE SOLAR HEATING AND CDOLING SYSTEM				
WRIGHT WALLACE A. JR.	189 TOLLEY SQUARE	SALT LAKE CITY	UT	84102
4111186 - FLAT PLATE SOLAR CDLLECTDR				
WYATT WILLIAM G.	8366 GARLAND RD.	DALLAS	TX	75218
4129115 - RADIANT ENERGY COLLECTDR				
YDKE JAMES H.	RTE. 15, BOX 395	ACTDN	IN	46259
4129119 - SDLAR ENERGY CDLLECTDR				
YOUNG SAM W.	1305 WHITE RD.	DPELIKA	AL	36801
4094300 - SOLAR HEAT COLLECTDR				
YU YING-NIEN	1018 DXFDRD AVE.	MARINA DEL REY	CA	90291
3943911 - SDLAR HEAT CDLLECTOR				
ZANI DAVID A.	P.D. BDX 165	KINGS HILL, ST. CRDI	VI	
4078546 - SDLAR ENERGY CDLLECTING DEVICE				
ZAUGG HANS	WEEKENDWEG 1	EINIGEN, CANTON OF B		CH
4116221 - SOLAR ENERGY CDLLECTING AND CDNCENTRATING APPARATUS				
ZELINGER STANLEY H.	14411 HEIGHTS DR.	TUSTIN	CA	92680
4079591 - SDLAR PDWER PLANT				
ZELTMANN WALTER	719 BAY RIDGE AVE.	BROOKLYN	NY	11220
3894345 - DRYING DEVICE				
ZENDS STEVEN	1520 SAGEBRUSH TRAIL, SE.	ALBUQUERQUE	NM	87123
4020605 - RODF UTILITY UNIT				
ZIEHM KURT F. JR.	P.D. BOX 13	LAND D'LAKES	WI	54540
4077849 - DESALINATIDN APPARATUS				
ZWILLINGER DANIEL	LAUREL LA.	NEW BDSTON	NH	03070
4079724 - RADIANT ENERGY CDLLECTOR PANEL AND SYSTEM				

PATENTS (1/63-12/78) WITH NEITHER ASSIGNMENT NOR INVENTDR INFDRMATIDN IN DATABASE

3957109

3436908 - SDLAR AIR MDVING SYSTEM

PATENTS (1/63-12/78) WITH NEITHER ASSIGNMENT NOR INVENTOR INFORMATION IN DATABASE

3450192 - PROCESS AND APPARATUS FOR MODULATING THE TEMPERATURE WITHIN ENCLOSURES
3453666 - SOLAR THERMAL BLANKET
3461878 - SUN CHAIR
3463577 - SUN REFLECTING BOARD
3464402 - SOLAR HEAT EXCHANGER CONSTRUCTION
3466119 - MULTIPLE MIRRORED APPARATUS UTILIZING SOLAR HEAT
3467840 - SOLAR THERMIONIC CONVERTOR
3483871 - SUNTANNING DEVICE
3496941 - SUN-BATHERS REFLECTOR DEVICE
3497676 - GOLF-BALL WARMER
3513828 - SOLAR WATER HEATER
3514942 - SOLAR HEAT TRANSDUCER APPARATUS
3561425 - SOLAR HEATERS
3563305 - PROCESS AND APPARATUS FOR MODULATING TEMPERATURES WITHIN ENCLOSURES
3587559 - WATER-HEATING APPARATUS UTILIZING SOLAR RAYS
3595216 - MOBILE SOLAR WATER HEATER
3598104 - SOLAR HEATING SYSTEM FOR SWIMMING POOLS
3599626 - SOLAR HEATER FOR SWIM POOLS
3610249 - SUN REFLECTOR BOOTH
3613659 - SOLAR ENERGY CONCENTRATING DEVICE
3625434 - DEVICE FOR SUNBATHING HAVING WATER SPRAY COOLING MEANS
3643648 - SOLAR HEATING DEVICES
3670717 - UNLIMITED QUANTITY OF POWER FROM SOLAR RADIATION SECURED WITH ZERO ATMOSPHERIC POLLUTION
3670750 - SUN COT
3680307 - HEAT ENERGY TRANSFER DEVICE
3688775 - SUN BATHING AND TANNING APPARATUS
3720197 - SOLAR ENERGY FOR WARMING OBJECTS, SUCH AS GOLF BALLS AND THE LIKE
3780262 - THERMAL BANK
3797476 - SOLAR HEATING DEVICE
3799145 - SOLAR HEATING SYSTEM
3815574 - SOLAR HEATING SYSTEM
3822692 - CONTROLLED SOLAR ENERGIZED POWER GENERATOR
3823703 - SELF-STORING SOLAR HEATER
3835482 - SUNTANNING TUB
3841738 - CURVED PAPER PANEL REFLECTIVE STRUCTURE
3847136 - SOLAR WATER-HEATING SYSTEMS
3853114 - SOLAR HEAT ABSORBER
3934573 - SPHERICAL SYSTEM FOR THE CONCENTRATION AND EXTRACTION OF SOLAR ENERGY
3971359 - LOUVERED SELECTIVE SOLAR ENERGY COLLECTOR
4128948 - METHOD AND APPARATUS FOR GRAIN DRYING AND STORAGE
4130106 - SOLAR STOVE

3072920	3075361	3076450	3077190	3078043	3079087	3085565	3087309	3088882	3089480	3089670	3097077
3102532	3104210	3104211	3105486	3106201	3107052	3109608	3117414	3118437	3121265	3125091	3129703
3130084	3130413	3134906	3137125	3138697	3145707	3146774	3152260	3152442	3154139	3155849	3156234
3159554	3161193	3162189	3170172	3171403	3173801	3174397	3174476	3174537	3174915	3176678	3176679
3178113	3179105	3182654	3190816	3192133	3193473	3194228	3196366	3197185	3200820	3203167	3205937
3207211	3208447	3215134	3217702	3220671	3225208	3227153	3229682	3231986	3232795	3234931	3236227
3236294	3239000	3239144	3242679	3243117	3244186	3247840	3249682	3250269	3251407	3251984	3252456
3254643	3254644	3254701	3254702	3254703	3262493	3266565	3268720	3270512	3270739	3271786	3272986
3273558	3275829	3277883	3277884	3279457	3279527	3282327	3285333	3286606	3290230	3295512	3297958
3299589	3299881	3300561	3301171	3303838	3305201	3305686	3310102	3314414	3314415	3321012	3336206
3337418	3348374	3353191	3363618	3364676	3366168	3369539	3369540	3369541	3372691	3374830	3375321
3376165	3379394	3387602	3390672	3391688	3399664	3401530	3406404	3411163	3412728	0	0

SOLAR HEATERS, AND SPACE HEATING AND COOLING SYSTEMS

PATENTING UPDATE (1/79-10/79)

Patent No.	Assignee & Title
4,132,074	James L. Lowe, St. Petersburg, FL: Paving And Solar Energy System And Method
4,132,217	Solar Energy Products Company: Solar Air Heat Collector
4,132,218	Christopher J. Bennett, Little Stratton, Moor Hall Lane, Danbury, Essex, England CM3 4ER: Vacuum Panel
4,132,219	Jeffrey M. Cohen, & Marion D. Cohen both of Parkway House, 2201 Pennsylvania Ave., Philadelphia, PA 19130: Extra-Focal, Convective Suppressing Solar Collector
4,132,220	Harry E. Thomason, 6802 Walker Mill Rd., SE, Washington, DC 20027: Solar Energy Collector
4,132,221	Alfred G. Orillion, 1201-E Cleermont Cir., Huntsville, AL 35801: Pyramidal Solar Heating System
4,132,222	Charles F. Roark, 24 Maple La, Brownsburg, IN 46112: Solar Energy Collector
4,132,223	E. Garland Reddell, 115 E. 26th St., Yuma, AZ 85364: Tracking System For Solar Energy Collector
4,132,356	James L. Ramer, Rte 1, Box 155, Sullivan, MO 63080: Solar Heating For Home Use
4,133,150	Joseph Yacoboni, Rte. 5, Box 409, Lake Placid, FL 33852: Dome And Semi-Dome-Shaped Structure
4,133,183	Borg-Warner Corporation: Solar Powered Absorption Refrigeration System
4,133,298	Sanyo Electric Co., Ltd, Moriguchi, Japan: Solar Heat Collecting Apparatus
4,133,299	Halm Instrument Co., Inc.: Solar Heat Absorber Plate
4,133,338	Allen K. Cooper, Santa Barbara, CA: Freeze Protection For Solar Heating Systems
4,134,387	Mobil Tyco Solar Energy Corporation: Solar Energy Concentrator
4,134,388	U.S. Philips Corporation: Solar Collector Comprising A U-Shaped Absorber

4,134,389 Michael McClintock, 162 Commerical St., Boston, MASS 02109: Solar Energy Collector

4,134,390 Davis I. Rawal, 25 Maybrook Rd., Waterbury, CONN 06708: Solar Heat Energy Transfer System

4,134,391 U.S. Philips Corporation: Solar Collector Comprising An Elongate Dewar Vessel

4,134,392 Spectrum Conversion Inc.: Solar Energy Collection

4,134,544 Harry E. Thomason, & Harry J.L. Thomason, Jr., both of 609 Cedar Ave., Fort Washington, MD 20027: Solar Heating System

4,135,367 Robert A. Frosch, Adm. of the National Aeronautics & Space Adm. w/ resp. to an invention of C. Martin Berdahl, Sierra Madre, & Carl L. Thiele, Pasadena, both of CA: Thermal Energy Transformer

4,135,489 Sanders Associates, Inc.: Solar Energy Conversion System

4,135,490 Bertrand S. Soleau, Jr., 4203 Kincaid Ct., Chantilly, VA 22021: Recircultating Natural Convection Solar Energy Collector

4,135,491 Tokyo Shibaura Electric Co., Ltd.: Dwellings Equipped With A Room-Heating Device & Hot Water Feeder Based On Solar Heat

4,135,492 Volkswagenwerk Aktiengesellschaft, Wolfsburg: Manifold Arrangement

4,135,493 Acurex Corporation: Parabolic Trough Solar Energy Collector Assembly

4,136,272 Thermatool Corporation: Method Of Manufacturing Heat Exchange Panels

4,136,668 Ariel R. Davis, 3476 Fleetwood Dr., Salt Lake City, Utah 84111: Solar Heat Storage And Utility System

4,136,669 George T. Lane, PO Box 306, Fleming, CO 80728: Solar Heat Collecting Module And Modular System

4,136,670 Theodore L. Davis, 21 Meryl St., Medway, MASS 02053: Solar Heating Collector Apparatus

4,136,671 Carl L. Whiteford, 3 High Point Rd., Westport, CONN 06902: Electromagnetic Radiation Reflector

4,136,672 Lawrence W. Hallanger, 1410 Ambrose, Oxnard, CA 93030: Flat Plate Solar Energy Collector

4,136,673 William J.D. Escher, 5065 Clinton Ave., St. Johns, MI 48879: Multimode Solar Energy Collector And Process

4,136,674 A.L. Korr Associates, Inc.: System For Solar Radiation Energy Collection And Conversion

4,136,675 Norman M. Karasick, 3254 Glendon Ave., Los Angeles, CA 90034: Solar Collector

4,137,097 Joseph E. Kelly, 508 Island St., La Crosse, WI 54001: Solar Energy Assembly

4,137,098 The United States of America as rep. by Sec. of the Navy, Wash., D.C.: Solar Energy Window

4,137,612 Robert V. Kelley, 837 Eton Dr., Burbank, CA 91504: Buoyant Pellet Covering For Swimming Pools

4,137,897 Walter T. Moore, 782 Mardigras Ct., Camarillo, CA 93010: Unified Array For Collection And Concentration Of Solar Energy

4,137,898 Tokyo Shibaura Electric Co., Ltd.: Air Type Solar Heating System

4,137,899 Harold J. Weslow, Jermore H. Weslow, both of Green Bay; Paul Netzow, Hartland, Thomas Weslow, Green Bay & Roland Weslow, Hartland, all of WI: Multistage Solar Energy Concentrator

4,137,900 Robert F. Brautigam, P.O. Box 102, Agenda, KA 66930: Solar Heating System

4,137,901 Henry B. Maier, 6 Sealy Ave., Hempstead, L.I., NY 11550: Solar Energy Collecting And Trapping Apparatus For Home Heating Or Cooling

4,137,902 Jesse C. Bunch, 816 Easley St., Silver Spring, MD 20910: Energy Concentrator System

4,137,903 Charles E. Annett, II, 213 Chardin Dr., Nokomis, FL 33555: Solar Heat Absorber

4,138,061 Harold C. Besack, Box 458, 221 N. 21st St., Beatrice, NB 68310: Solar Heating System

4,138,293 Kurt F. Ziehm, Jr., P.O. Box 13, Land O' Lakes, WI 54540: Desalination Apparatus

4,138,850 Dimiter I. Tchernev, 9 Woodman Rd., Chestnut Hill, MASS 02167: Sorption System For Low-Grade (Solar) Heat Utilization

4,138,989 George H. Doyle, 824 Camino de Paz, El Paso, TX, 79922 & John R. Johnston, Star Rt., Box 1262, Corrales, NM 87048: Flat Plate Solar Collector System

4,138,990 JENARer Glaswerk Scholt & Gen., Mainz, Fed. Rep. of Germany: Fibrous Wall Material For Cell Structures Of Solar Energy Collectors

4,138,991 Maschinen fabrik Augsburgnurnberg Aktiengesellschaftman: Flat Solar Collector

4,138,992 Lloyd H. Shaffer, deceased, late of Stamford, Conn., by Dorothy B. Shaffer, executrix, 156 Interval Rd., Stamford, CT 06905: Viscosity Stabilized Solar Ponds

4,138,993 William M. Canley, 376 Franklin Ave., Redlands, CA 92373: Solar Heater

4,138,994 Robert M. Shipley, Jr. 259 Candlelight Dr., Santa Rosa, CA 95401: Solar Heating Unit

4,138,995 Shao W. Yuan, 2021 Highboro Way, Falls Church, VA 22043: Solar Energy Storage And Utilization

4,138,996 Rheem Manufacturing Company: Solar Heater Freeze Protection System

4,138,997 Fedders Corporation: Solar Heat Collector

4,139,055 Harry E. Thomason, & Harry J.L. Thomason, Jr. both of 6802 Walker Mill Rd., SE, Washington, D.C. 20027: Solar Heating (Cooling)

4,139,286 Leopold A. Hein, Rte. 7, Fayetteville, TN 37334 & William N. Myers, 4306B Boxwood Ct., Huntsville, AL 35805: Apparatus For Concentrating Solar Energy

4,139,321 Frank D. Werner, Box SR9, Jackson, WY 83001: Rock Channel Heat Storage

4,140,103 The Broken Hill Proprietary Company Limited: Solar Energy Collectors

4,141,185 Elvin W. Keith, 1115 E. 31st, Kearney, Neb 68847: Solar Collector Cover

4,141,337 Addison Products Company: Solar Window Unit

4,141,338 George O.G. Lof, 3367 S. Willow Ct., Denver, CO 80231: Solar Heat Absorber

4,141,339 Westinghouse Electric Corp.: Solar Heat Collector

4,141,340 William P. Niedermeyer, 1024 Mt. Mary Dr., Greenbay, WI 54304: Solar Energy Collector

4,141,341 Arden T. Eby, Box 268, Redmond, OR 97756: Solar Heating Panel

4,141,498 Walter Marschner, 1292 Main St., Slatington, PA 18080: Combination Structure And Greenhouse Utilizing Indirect Solar Energy

4,141,626 FMC Corporation: Method And Apparatus For Collecting Solar Radiation Utilizing Variable Curvature Cylindrical Reflectors

4,142,509 U.S. Philips Corporation: Solar Collector Comprising An Evacuated Cover

4,142,510 Fortress Engineering Limited: Solar Heater

4,142,511 General Dynamics Corp.: Solar Radiation Collector Devices And Systems

4,142,512 Darrell R. Brown, 2558 N.W. 19th St., Oklahoma City, OK 73107: Solar Vaporizing Chamber

4,142,513 Raymond N. Auger, 709 Spruce St., Aspen, CO 81611: Hybrid Solar Collector

4,142,514 Solation Products, Inc.: Solar Heat Collector

4,142,678 Edward W. Bottum, 9357 Spencer Rd., Brighton, MI 48116: Combined Heat Pump And Ice Making System

4,143,233 Monsanto Research Corp.: Solar Energy Collector

4,143,640 Massachusetts Institute of Technology: Venetian-Blind Solar Collector

4,143,641 John C. Christopher, 68 Charlonne St., Jaffrey, NH 03452: Solar Energy Collector

4,143,642 Vapor Corporation: High Temperature Thermal Storage System Utilizing Solar Energy Units

4,143,643 Albert A. Gerin, 7 rue des Ecoles, And Claude G. Blanc, 5 rue du Moulin, both of Vinay (Isere), France: Solar Heat Trap With Double Fluid Circuits

4,143,644 Volkswagenwerk-Aktiengesellschaft: Apparatus For Producing Useful Heat From Solar Radiation

4,143,705 Thomas Y. Awalt, P.O. Box 1053, Pensacola, FL 32595: Storage For Heat And Cold

4,143,814 Ultimate Engineering Corporation: Control And Transfer Of Energy

4,143,815 Energietechnik GmbH: Heating Apparatus

4,144,680 Thomas L. Kelly, 50 Randolph Ave., Waterbury, CN 06710: Free Form Building Construction

4,144,716 Edsel Chromie, 6720 Belle Glade, San Diego, CA 92119: Solar Powered Engine And Tracking System

4,144,871 Donald F. Porter, 130 Ramsey Pl., Albany, NY 12209: Solar Heat Collector

4,144,872 Halm Instrument Co.: Solar Energy Collector

4,144,873 C. Kenneth Blanton, No. 49, Pahlavi Pahlavan, Tehran, Iran: Apparatus For Refracting, Concentrating And Collecting Solar Radiation

4,144,874 Sunhouse, Inc.: Solar Panel

4,144,875 Richard Bruno, Kirchstrasse 82, 5100 Aachen, (and six other inventors): Solar Collector Comprising An Entrance Window Consisting Of Evacuated Tubes

4,144,931 John J. Medico, 5331 Cape Leyte Dr., Sarasota, FL 33581: Solar Heating And Cooling Collector Window

4,144,999 Sunhouse, Inc: System And Structure For Conditioning Air

4,145,021 Agence Nationale de Valorisation de la Recherche (ANVAR): Altazimuth Orientation Support

4,146,011 Harry E. Thomason and Harry J. Thomason, Jr.: Solar Energy

4,146,012 Acurex Corporation: Solar Heat Exchange Panel

4,146,013 Willing B. Foulke, 109 Greenridge Rd., Wilmington, DE 19804: Solar-Exothermic Solution Heat Pump

4,146,014 Joseph Allegro, 377 Ellamar Rd., West Palm Beach, Fl 33405: Inner Roof Solar System

4,146,015 Engineering & Research Associates, Inc.: Solar Pool Heater

4,146,057 Rockwell International Corp.: Thermal Buffer System

4,146,087 Automatik-Varme-Ventilationsservice AVV AB: Device For Accumulation Tanks For Fluid

4,146,784 Yeda Research & Development Co., Ltd.: Sun Tracking Device

4,146,785 Sunpower Systems Corporation: Sun-Tracking Control System For Solar Collector

4,147,154 Robert E. Lewandowski, c/o Mayfield Stage, Boise, ID 83707: Solar Heat Tracking And Collecting Apparatus

4,147,155 Frederick G. Krafft, 2975 Fox Hollow Rd., Springfield, OH 45502: Device For Collecting Solar Energy

4,147,156 Sunworks, Inc.: Solar Energy Collector Having A Convection Current Inhibiting Member

4,147,157 Ramig H. Zakhariya, 2400 McBride La., No. 50, Santa Rosa, CA 95401: Self-Supporting Active Solar Energy System

4,147,158 Chang Chieh-Tsung: Multi-Layered Solar Energy Collector

4,147,300 Thomas W. O'Rourke: Method And Structure For Solar Heating

4,147,414 William H. Raser, 6451 W. 83rd St., Los Angeles, CA 90045: Sunlight Concentrator For Energy Conversion

4,147,561 John R. Knight, 10 Milton Rd., Gayton, Northampton, England: Solar Energy Collector

1,148,293 James M. Lents, 2938 Old Britain Cir., Chattanooga, TN 37407, and Barry V. Rhodes, Sr. Rt.1, Johnson Rd., Chickamauga, GA 30707: Solar Energy Receptor Apparatus

4,148,294 Dornier System GmbH: Solar Collector Panel And Method Of Making

4,148,295 United States of America, National Aeronautics And Space Adm.: Horizontally Mounted Solar Collector

4,148,296 Phillip Parlato, 64 Primrose La., Kings Park, NY 11754: Solar Heating Apparatus And Mounting Therefor

4,148,297 Benjamin F. Sherman, Jr., 6329 Mori St., McLean, VA 22101: Collector Of Direct Dispersed And Reflected Waves

4,148,298 Benjamin F. Sherman, Jr., 6329 Mori St., McLean, VA 22101: Hemispherical Collector Of Direct Dispersed And Reflected Waves

4,148,299 Benjamin F. Sherman, Jr., 6329 Mori St., McLean, VA 22101: Hemitoroidal Collector Of Direct Dispersed And Reflected Waves

4,148,300 Larry L. Kaufman, Sr., 9880 N. Hawkins Hwy., Brooklyn, MI 49230: Solar Radiation Energy Concentrator

4,148,301 C. Brent Cluff, 5525 N. Grande, Tucson, AZ 85704: Water-Borne Rotating Solar Collecting & Storage Systems

4,148,564 Commissariat a l'Energie Atomique, France: Solar Sensor With Linear Concentrator With A Fixed Receiver And Movable Mirrors

4,149,520 Asa S. Arent, 700 15th St., North, Humboldt, Iowa 50548: Passive Sealed Flat Plate Solar Heat Collector With An Attached Reflecting Panel For The Collection, Storage, And Radiation Of Solar Heat

4,149,521 James C. Fletcher, Adm. of the National Aeronautics & Space Adm. with respect to an invention of Charles G. Miller, Pasadena, & James B. Stephens, La Crescenta, both of CA: Solar Energy Collection System

4,149,522 Motorola, Inc.: Solar Heat Collector With Convection Suppressor

4,149,523 Betin & Cie, Plaisir, France: Solar Energy Collector System With Cylindro-Parabolic Mirror

4,149,524 Honeywell, Inc.: Corrosion Resistant Solar Absorber Panel

4,149,525 David A. Prado, 2002 W. 19th St., Chicago, ILL 60608: Solar Collector

4,149,589 Fred Hopman, P.O. Box 171, Arroyo Seco, New Mexico 87514: Self-Insulating Water Wall

4,149,817 James C. Fletcher, Adm. of the National Aeronautics & Space Adm. with respect to an invention of Charles G. Miller, Pasadena, & James B. Stephens, La Crescenta, both of CA: Primary Reflector For Solar Energy Collection Systems And Method Of Making Same

4,149,856 Willy Keller, Hettlingerstrasse 7, 8472 Senzach, Zurich, SW: Method And Apparatus For Producing A Gaseous Fuel By Means Of Solar Energy

4,149,902 Eastman Kodak Company: Fluorscent Solar Energy Concentrator

4,149,903 Solarex Corporation: Hybrid Solar Energy Collecting Device

4,150,552 Gerald Altman, 41 Westminster Rd., Newton Centre, MASS 02159: Infrared Cooler For Restricted Regions

4,150,657 Raytheon Company: Solar Collector

4,150,659 Bruce S. Buckley, 410 Memorial Dr., No. 154, Cambridge, MASS 02139: Apparatus For Preventing High Temperatures In A Glazed Solar Collector

4,150,660 Margot Elizabeth Peters, East Dennis, & Albert F. Kronman, Locust Valley, NY: Easy Access Energy Conversion Panels For Solar Heating Systems

4,150,661 Marino S. Trimboli Callegari & Antonio A. Trimboli Longetto, both of concah-Espina 63 Atico, Madrid, Spain: Layout For Collecting Solar Energy Applicable To Acclimatizing All Types Of Buildings

4,150,662 Verl R. Summers, 282 South 200 East, Hyrum, Utah 84319: Solar Energy Structure

4,150,663 Kenneth J. Sisson, 20 Sunken Meadow Rd., Northport, Ny 11768: Solar Energy Collector & Concentrator

4,150,720 Imperial Chemical Industries Limited: Heat Exchanger

4,150,787 Chris R. Braathen, 4645 Belvedere Dr., P.O. Box 686, Julian, CA 92036: Method & Arrangement For Saving Energy In Preparing Hot Water For Household

4,151,408 Brown Manufacturing Company: Sun Tracking Control System

4,151,721 Emerson L. Kumm, 1035 E. Laguna Dr., Tempe, AZ 85282: Solar Powered Air Conditioning System Employing Hydroxide Water Solution

4,151,828 Solar Power, Inc.: Solar Energy Collection Tube

4,151,829 Suntron Energy Systems, Ltd.: Solar Energy Collector

4,151,830 Chicago Solar Corporation: Inflated Flexible Solar Collectors

4,151,954 J. Ethan Jacobs, 120 Church Rd., Winnetka, ILL 60093: Heat Regulating System And Method For A Building Involving Control Of Incident Solar Radiation

4,153,037 Boris Isaceson, 14532 Vanowen St., Van Nuys, CA 91405: Solar Collector Module & Solar Collector System

4,153,038 Bernard McDonald, 7700 Seville Ave., Huntington Park, CA 90255: Solar Energy Collecting System

4,153,039 John H. Carroll, 3021 Grand Ave., Fillmore, CA 93014: Focusing Solar Energy Apparatus

4,153,040 Halm Instrument Co., Inc.: Protective Cooling Systems For Solar Heat Collector

4,153,041 Thomson-Brandt & Compagnie des Lampes: Solar Energy Collector

4,153,042 National Patent Development Corporation: Solar Collector

4,153,043 Reynolds Metals Company: Apparatus For Solar Hot Water System And Method Of Making Same

4,153,047 Robert F. Dumbeck, 104 Anderson Dr., Elgin, TX 78621: Heat Storage Systems

4,153,104 Overland Energy, Inc.: Solar Heating And Cooling System

4,153,955 Henry Hinterberger, Rte. 1, Box 20-S Batavia, Ill 60510: Solar Energy Converter

4,154,219 E-Systems, Inc.: Prismatic Solar Reflector Apparatus And Method Of Solar Tracking

4,154,220 John L. Loth, P.O. Box 4094, Morgantown, W. VA 26505: Flat-Plate Solar Collector With Air Flowing Through The Grooves In A Form Absorber Surface

4,154,221 American Solar: Tracking System For Solar Energy Collection

4,154,222 Ying Manufacturing Corporation: Solar Collector For Gas Heating

4,154,223 George O. G. Lof, Parkway Dr., Englewood, CO 80110: Modular Construction For Solar Heat Collector

4,154,224 Cress R. Ferriera, 713 Paloma Ave., Stockton, CA 95210: Solar Steam Generator

4,154,292 General Electric Company: Heat Exchange Method And Device Therefor For Thermal Energy Storage

4,155,226 Gerald Altman, 41 Westminster Rd., Newton Centre, MASS 02159: Infrared Cooler For Restricted Regions

4,155,344 Halm Instrument Co., Inc.: Air-Heating Solar Collector

4,155,345 Jean-Pierre Madern, Route de Perpignan, Cabestany, France 66330: Solar Energy Pick-Up

4,155,346 Robert J. Aresty, 553 Pretty Brook, Princeton, NJ 08540: Solar Energy Collector

4,155,347 Contraves AG: Solar Radiation Collector

4,155,981 The U.S. of America as rep. by the Secretary of the Navy: Rectangular Cell Honeycomb Chemical Converter-Heat Exchanger

4,156,419 Hawthorne Industries, Inc.: Solar Collector

4,156,420 Charles F. Gunderson, 1622 N. Marconi Rd., Belmar, NJ 07719: Solar Heat Collector

4,156,455 Theo Van der Meulen, Petersbergstrasse 4, 5204 Lohmar 21 Fed. Rep. of Germany: Method And Apparatus For Controlling A Heat Transfer Installation

4,157,620 Jonathan P. Chakerian, 269 W. Sycamore, Reedly, CA 93654: Method Of Producing Bleached, Dried Fruit

4,157,706 Emanuel P. Gaskill, 15 Bay Ave. Somers Point, NY 08244: Water Heater

4,158,354 The Energy Research Foundation, Australia: Solar Energy Collection System

4,158,355 Hermann F. Spitzer, 8004 Aucade St., Lorton, VA 22079: Solar Energy Collectors

4,158,356 David V. Wininger, P.O. Box 337 606 Bjornsen, Big Rapids, MI 49307: Self-Powered Tracking Solar Collector

4,158,357 Joseph Albegro, 377 Ellamar Rd., West Palm Beach, FL 33405: Inner Roof Solar System

4,158,358 Harry E. Thomason, & Harry J. L. Thomason, both of 609 Cedar Ave., Washington, D.C. 20022: Heat & Cold Storage Apparatus

4,159,017 Sam Novi, 1686 Great Hwy., San Francisco, CA 94116: Solar Panel System

4,159,706 U.S. Philips Corporation: Solar Collector Comprising An Evacuated Absorber Cover Tube

4,159,707 Agence Nationale de Valorisation de la Recherche, Neuily, France: Solar Energy Collector And Installation Employing Same

4,159,708 Near Star Solar, Inc.: Solar Energy Collector And Heat Exchanger

4,159,709 FIAT Societa per Azioni Turin, Italy: Low Cost Solar Panel

4,159,710 U.S. Philips Corporation: Solar Collector Comprising Solar Tracking Means

4,159,711 George P. Johnson, 1951 Hollywood Pkwy., York, PA 17403: Solar Heating Apparatus

4,159,712 Howard W. Legg, 2229 N. Park, Grand Island, NB 68801: Solar Energy Conversion Unit

4,160,443 Donald Shanfelt: Dannie K. Brindle, Dennis D. Kiser, David W. Armagast, & Patrick F. Lynch, Pt. interest to each: Inflatable Solar Heat Collector

4,160,444 Ralph A. Hamilton, 1836 Lake St., Glendale, CA 91201: Omnidirectional Heat Pipe

4,160,523 Graham A. Stevens, 55 Colebrook Row, London, NI England: Air Structure

4,161,169 Solar Energy Systems, Inc.: Focussing Flat Plate Solar Collector Device

4,161,180 Howard L. Tiger, Eagle Ridge Way, West Orange, NJ 07052: Suntrap Solar Radiation Collector

4,161,212 Martin Marietta Corporation: Pneumatically Controlled Wide Heat Load Space Radiator

4,161,809 Honeywell, Inc.: Method of Fabricating A Solar Absorber Panel

4,161,942 Robert F. Monk, 4640 Country Creek, Apt. 1255, Dallas, TX 75236: Solar Energy Collector

4,162,671 Donald Christy, 1005 Washington, Scott City, Kansas 67871: Solar Energy Panel And Medium For Use Therein

4,162,684 Charles C. Loveless, Jr., 1508 W. 8th St., Roswell, NM: Solar Ice Melter For Use At Low Ambient Temperature

4,162,825 Ford Aerospace & Communications Corporation: Method For Adjusting The Radius Of Curvature Of A Spherical Mirror

4,163,369 Charles Owen, 2120 Cannon Way, Marietta, Ga 30064: Air-to-Air Heat Pump

4,163,445 Colin N. Stanger, Niavaran, 3 Grenville, Close, Cobham, Surrey, England: Roofing Panels

4,164,123 Otto J.M. Smith, 612 Euclid Ave., Berkeley, CA 94708: Solar Thermal Electric Power Plant

4,164,125 Midland-Ross Corporation: Solar Energy Assisted Air-Conditioning Apparatus And Method

4,164,932 Grumman Corporation: Solar Heat Collector Construction

4,164,933 Anthony C. Alosi, 5050 Tamarus, Apt. 159, Las Vegas, NV 89109: Concrete Solar Collectors

4,164,935 Solar Apparatus & Equipment Limited: Solar Heating Panels

4,165,036 Milton Meckler, 16348 Tupper St., Sepulveda, CA 91343: Multi Source Heat Pump Air Conditioning System

4,165,037 Donald M. McCarson, Rte. 1, Box 143, Pisgah Forest, NC 28768: Apparatus And Method For Combined Solar And Heat Pump Heating And Cooling System

4,165,732 Pechiney Ugine Kuhlmann, France: Process And Apparatus For Obtaining Hot Water By Use Of Solar Energy

4,165,733 Olin Corporation: Solar Energy Collector System

4,165,734 Gunter A. Schmidt, Hohenzollernstrasse 114, 8000 Munchen 13 Fed. Rep. of Germany: Solar Motor

4,165,735 Harold T. Smith, 5623 Fillmore, St., Hollywood, FL 33021: Solar Energy Collector & Storage Device

4,165,952 Motorola, Inc.: Heat Energized Vapor Absorbent Pump

4,166,445 Thomas F. McGraw, 7538 Axton St., Springfield, VA 22151: Low Cost Solar Collector

4,166,446 BBC Brown Boveri & Co., Ltd.: Solar Collector

4,166,449 Walter L. Depew, 3111 W. 54th Ave., Denver, Co 80221: Heat Storage Vault

4,166,769 Joseph Dukess, 931, Greacen Point Rd., Mamaroneck, NY 10543: Solar Heat Apparatus

4,166,917 Corning Glass Works: Concentrating Solar Receiver

4,167,178 Solar Energy Systems, Inc.: Stationary Type Solar Energy Collector Apparatus

4,167,934 Portio Corporation: Method And Apparatus For Inhibiting Absorption Of Solar Energy

4,167,935 Honeywell, Inc.: Phenolic Laminate Solar Absorber Panel And Method Of Making

4,167,936 Albert J. Hackworth, 1912 A Pacific Ave., Venice, CA 90291: Static Solar Tracker And Energy Converter

4,167,937 Lars A. Bergkvist, Gottne, 890 42 Mellansel, Sweden: Device At Heating A Liquid By Solar Energy

4,167,965 Carrier Corporation: Integral Water-Refrigerant- Air Heat Exchange System

4,168,696 Donald A. Kelly, 58-06 69th Pl., Maspeth, NY 11378: Four Quadrant, Two Dimensional, Linear Solar Concentration Panels

4,169,459 Brent H. Ehrlich, R.R. 1, Box 269, Murphysboro, ILL 62966: Solar Converter

4,169,460 John M. Popovich, 1717 W. Alameda St., Burbank, CA 91506; Thomas R. Thornbury, 1942 Crestshire Dr., Glendale, CA 91208: Solar Converter System With Thermal Overload Protection

4,169,461 Henry W. Haug, 7470 Boris St., Rohnert Park, CA 94928; Gary M. Shon, 5525 Hutchinson Rd., Sebastopal, CA 95472 & Albert P. Lenhardt, 762 Pordon La., Healdsburg, CA 95448: Storage Tank Especially Suitable For Use In A Solar Heat System

4,169,499 Honeywell, Inc.: Solar Heat Energy Heat Utilization

4,169,554 Eldon D. Camp, R.R. 2 Bloomington, ILL 61701: Solar Energy System With Heat Pump Assistance

4,169,712 James R. Boyce, Rte. 3, Box 201, Orlando, FL 32811 & Erich A. Farber, 1218 NE 5th St., Gainesvlle, FL 32601: Solar Energy Collection And Utilization System

4,169,791 Waste Mgt., Inc.: Apparatus And Process For Volume Reduction Of Aqueous Waste Through Solar Evaporation

4,170,220 Henry C. Smith, P.O. Box 307 Johns Island, SC 29455: Solar Heat Collector

4,170,221 Grumman Corporation: Solar Heat Collector Construction

4,170,222 Ray D. Barker, 5228 Lone Tree Dr., Loveland, CO 80537: Solar Heat Collector

4,170,223 Andries C. Weideman, 14 Leipoldt St., Parow North, South Africa: Solar Heat Energy Collector

4,170,261 Nikolaus Laing, Ingeborg Laing, & Oliver Laing, all of Hofener Weg. 35-37, D7148 Remseck 2 near Stuttgart, Fed. Rep. of Germany: Heat Storage Device

4,170,507 Motorola, Inc.: Method For Encapsulating A Solar Cell Array

4,170,982 Joseph C. Soncarato, Shelton, Conn.: Solar Energy Storage And Distributing Device

4,170,983 Charlton Sadler, P.O. Box 446, Brookville, FL 33512: Solar Heater

4,170,984 Atlantic Research Corporation: Solar Energy Heat Collector

4,170,985 Agence Nationale de Valorisation de la Recherche (ANVAR): Solar Energy Collector

4,171,003 Commissariat a l'Energíe Atomique: Solar Energy To Electrical Energy Converter

4,171,619 Silas W. Clark, P.O. Box 43, Golden, CO 80401: Compressor Assisted Absorption Refrigeration System

4,171,620 Nelson C. Turner, P.O. Box 36100, Houston, TX 77036: Cooling Method And System

4,171,694 University of Kentucky: Triangular Duct Solar Panel

4,171,695 Solar Energy Technology, Inc.: Image Collapsing Concentrator And Method For Collecting And Utilizing Solar Energy

4,171,876 Douglas E. Wood, Box 32, Fox Island, WA 98333: Apparatus For Supporting Large-Dimension Curved Reflectors

4,171,993 Borg-Warner Corporation: Coated Metal Nodule Solar Heat Collector

4,172,311 American Solar Heat Corporation: Process For Manufacturing Solar Collector Panels

4,172,441 Sunburst Solar Energy: Solar Heat Collector Panel And Method Of Forming Same

4,172,442 Bio Gas Systems, Inc.: Solar Energy Collector System & Method

4,172,443 Warren T. Sommer, 2608 N. Humboldt Blvd., Milwaukee, WI 53212: Central Receiver Solar Collector Using Analog Coupling Mirror Control

4,172,740 William P. Campbell, III, 3310 Rowland Pl, NW, Washington, D.C. 20008: Solar Energy System

SOLAR DISTILLATION AND EVAPORATION CONCENTRATION

This profile includes apparatus and processes for effecting distillations and evaporation concentrations. The distillations are separation processes for obtaining a desired liquid (such as potable water) from a mixture or solution. The evaporation concentration process generally involves evaporating a liquid from a mixture or solution to obtain a concentrated residual material such as a salt or brine.

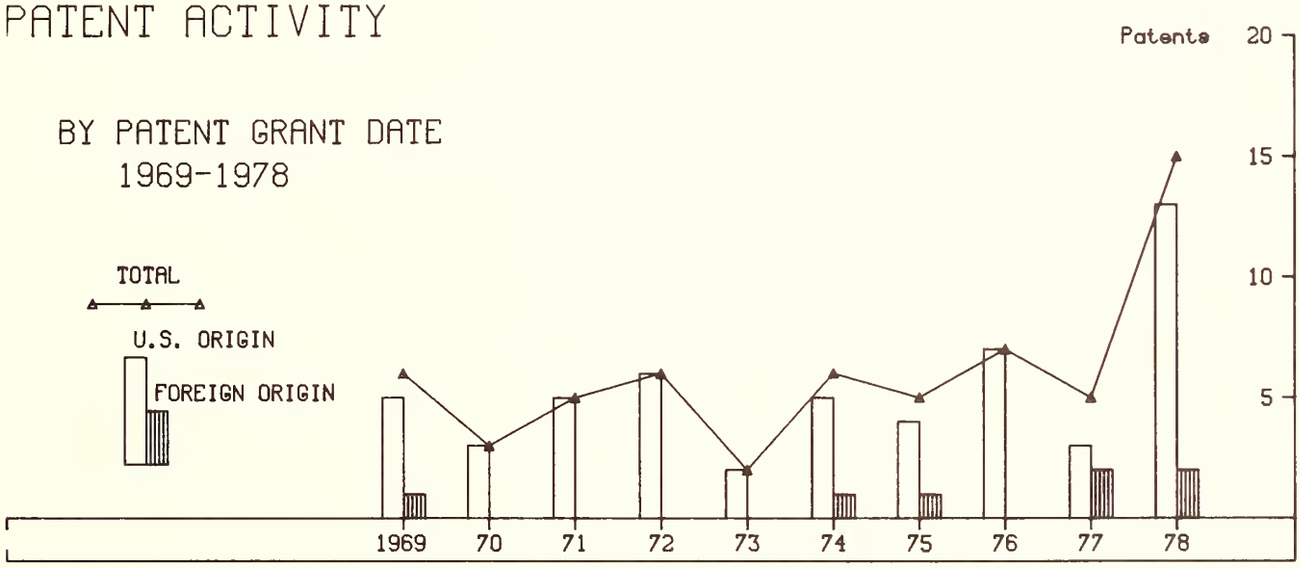
INCLUDED IN THIS PROFILE ARE ALL OF THE PATENTS FROM:
- Class 23, Subclass 295S
- Class 159, Subclasses 1S,1SF
- Class 203, Dig 1

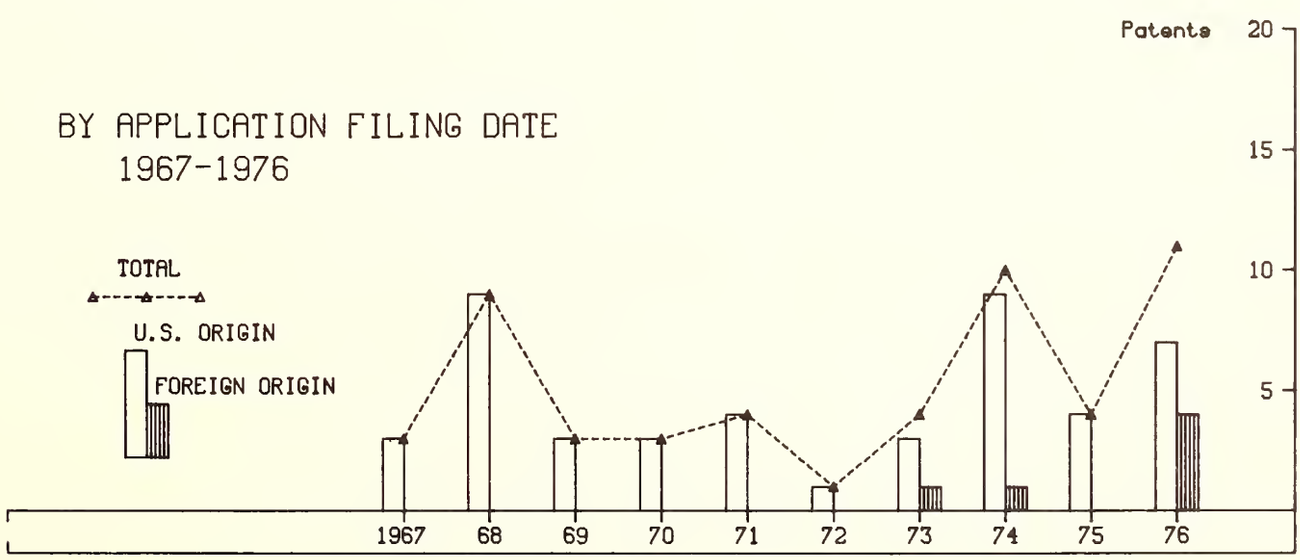
AND SELECTED PATENTS FROM:
- Class 60, Subclass 641
- Class 202, Subclass 234

ACTIVITY INDICES (1976-1978)

GROWTH	45.0%
FOREIGN SHARE	14.8%
CORPORATE OWNED	48.2%
GOVERNMENT OWNED	0.0%
U.S. OWNED OF FOREIGN	0.0%

PATENT ACTIVITY





SOLAR ENERGY - SOLAR DISTILLATION AND EVAPORATION CONCENTRATION

PATENT ACTIVITY (1963-1978) BY DATE OF PATENT GRANT

	NUMBER OF PATENTS															
	63-64	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	TOTAL
TOTAL	13	8	8	13	8	6	3	5	6	2	6	5	7	5	15	110
U.S. ORIGIN	11	6	7	11	7	5	3	5	6	2	5	4	7	3	13	95
FOREIGN ORIGIN	2	2	1	2	1	1					1	1		2	2	15
JAPAN			1	1	1										1	4
CHINA(TAIWAN)														1	1	2
SPAIN		1				1										2
SWITZERLAND														1		1
FRANCE		1														1
SAUDI ARABIA	1															1
WEST INDIES				1												1
MOROCCO	1															1
CANADA												1				1
GERMANY											1					1
U.S. ORIGIN	11	6	7	11	7	5	3	5	6	2	5	4	7	3	13	95
U.S. CORP. OWNED	3	1	5		4	1	1	4	1		3		2	2	7	34
U.S. GOVT. OWNED					1											1
U.S. INDIV. OWNED	8	5	2	11	2	4	2	1	5	2	2	4	5	1	6	60
FOREIGN OWNED																
FOREIGN ORIGIN	2	2	1	2	1	1					1	1		2	2	15
U.S. OWNED											1					1
FOREIGN OWNED	2	2	1	2	1	1						1		2	2	14
FOREIGN CORP.			1	1		1								1	1	5
FOREIGN GOVT.																
FOREIGN INDIV.	2	2		1	1							1		1	1	9

SOLAR ENERGY - SOLAR DISTILLATION AND EVAPORATION CONCENTRATION

PATENT ACTIVITY (PATENTS GRANTED 1/67-12/78) BY DATE OF PATENT APPLICATION

	NUMBER OF PATENTED APPLICATIONS															
	PRE 65	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	TOTAL
TOTAL	11	8	6	3	9	3	3	4	1	4	10	4	11	4		81
U.S. ORIGIN	9	8	4	3	9	3	3	4	1	3	9	4	7	4		71
FOREIGN ORIGIN	2		2							1	1		4			10
JAPAN	1		1										1			3
CHINA(TAIWAN)													2			2
SPAIN			1													1
SWITZERLAND													1			1
FRANCE																
SAUDI ARABIA																
WEST INDIES	1															1
MOROCCO																
CANADA											1					1
GERMANY										1						1
U.S. ORIGIN	9	8	4	3	9	3	3	4	1	3	9	4	7	4		71
U.S. CORP. OWNED	2	1	2		5	2		2			2	1	5	3		25
U.S. GOVT. OWNED			1													1
U.S. INDIV. OWNED	7	7	1	3	4	1	3	2	1	3	7	3	2	1		45
FOREIGN OWNED																
FOREIGN ORIGIN	2		2							1	1		4			10
U.S. OWNED										1						1
FOREIGN OWNED	2		2								1		4			9
FOREIGN CORP.	1		1										2			4
FOREIGN GOVT.																
FOREIGN INDIV.	1		1								1		2			5

SOLAR DISTILLATION AND EVARPORATION CONCENTRATION

ASSIGNEES WITH 1 OR MORE PATENTS (1/69 - 12/78)

UOP INC.	8
GREAT SALT LAKE MINERALS AND CHEMICALS CORP.	6
DOW CORNING CORPORATION	2
CORNELL-DUBILIER ELECTRIC CORP.	1
BATTELLE MEMORIAL INSTITUTE	1
ESB INCORPORATED	1
DAMES AND MOORE	1
INSTITUTO NACIONAL DE INDUSTRIA	1
OCCIDENTAL PETROLEUM CORPORATION	1
PITTSBURGH CORNING CORPORATION	1
SPECTRA INTERNATIONAL, INC.	1
RIKAGAKU, KENKYUSHO	1

ASSIGNED PATENTING(1/69 - 12/78) - - ALPHA LISTING

BATTELLE MEMORIAL INSTITUTE
4053368 - PROCESS FOR THE PURIFICATION OF WATER

CORNELL-DUBILIER ELECTRIC CORP.
3551756 - ELECTROLYTIC CAPACITORS WITH MECHANICALLY STABILIZED ELECTRODE ASSEMBLY

DAMES AND MOORE
3956059 - METHOD OF REDUCING MOISTURE CONTENT OF PARTICULATE SLURRIES

DOW CORNING CORPORATION
3616836 - ACCELERATING WATER EVAPORATION BY THE ADDITION OF AN ORGANO-SILICON COMPOUND
4107000 - SOLAR STILL

ESB INCORPORATED
3785931 - SOLAR STILL AND THE LIKE

GREAT SALT LAKE MINERALS AND CHEMICALS CORPORATION
3589871 - METHOD FOR THE PRODUCTION OF HIGH-GRADE KAINITE
3592615 - METHOD FOR PRODUCING POTASSIUM SALTS BY SOLAR EVAPORATION OF NATURAL BRINES
3615259 - SOLAR POND SYSTEM FOR THE PRODUCTION OF CONCENTRATED BRINES UTILIZING PLURAL SERIAL SOLAR SUB-ZONES
3667980 - STRONG SALT FLOOR COMPRISING HALITE CRYSTALS, MAGNESIUM SULFATE AND POTASSIUM
3833504 - MOIST ROAD SALT COMPOSITION AND PROCESS FOR MAKING THE SAME
3852044 - RECOVERY OF SUBSTANTIALLY POTASSIUM-FREE HYDRATED MAGNESIUM CHLORIDE FROM CONTAMINATED AQUEOUS SOLUTIONS

INSTITUTO NACIONAL DE INDUSTRIA
3428529 - SOLAR DISTILLATION OF FOAMED SALINE WATER TO RECOVER FRESH WATER

OCCIDENTAL PETROLEUM CORPORATION
3977835 - COOLING PROCESS FOR SELECTIVE SALT CRYSTALLIZATION

PITTSBURGH CORNING CORPORATION
3801474 - PROCESS AND APPARATUS FOR SOLAR DISTILLATION UTILIZING CELLULAR CERAMIC NODULES TO IMPROVE THE EVAPORATION RATE

RIKAGAKU, KENKYUSHO
4075062 - THROW-IN TYPE COLORIMETER

SPECTRA INTERNATIONAL, INC.
3436315 - SOLAR HEATED COLUMN STILL

UOP INC.
4046639 - POWER GENERATION AND POTABLE WATER RECOVERY FROM SALINOUS WATER
4046640 - POWER GENERATION AND POTABLE WATER RECOVERY FROM SALINOUS WATER
4072579 - POWER GENERATION AND POTABLE WATER RECOVERY FROM SALINOUS WATER
4078975 - SOLAR POTABLE WATER RECOVERY AND POWER GENERATION FROM SALINOUS WATER
4078976 - SOLAR POTABLE WATER RECOVERY AND POWER GENERATION FROM SALINOUS WATER
4110172 - SOLAR ENERGY COLLECTING POND
4110174 - POWER GENERATION AND POTABLE WATER RECOVERY FROM SALINOUS WATER
4121977 - POWER GENERATION AND POTABLE WATER RECOVERY FROM SALINOUS WATER

UNASSIGNEO PATENTS (1/75-12-78) INVENTORS (ALPHA LISTING)

INVENTOR NAME	STREET	CITY	ST	ZIP/CNTRY
DIGGS RICHARO E.	12A RO.	CARTHAGE	MO	64836
4118283 - APPARATUS FOR DESALINATING WATER				
OIMITROFF BORIS	4014 PERLITA AVE. NO. 6	LOS ANGELES	CA	90039
4068474 - APPARATUS ANO PROCESS FOR STEAM GENERATION BY SOLAR ENERGY				
FRANK MATTHEW WILLIAM	745 S. 44TH	BOULOER	CO	80303
3875926 - SOLAR THERMAL ENERGY COLLECTION SYSTEM				
GREEN HARRY S.	RTE. 1, BOX 253	WILMINGTON	IL	60481
4131513 - SEAWATER DISTILLATION APPARATUS				
HAROMAN GILBERT J.	4490 MARINE OR.	WEST VANCOUVER, BRIT		CA
3880703 - TREATMENT OF PHOSPHATE SLIMES				
HAY HAROLO R.	2424 WILSHIRE BLVO.	LOS ANGELES	CA	90057
4055473 - PROCESS ANO APPARATUS FOR SOLAR OISTILLATION				
KUREK JOHN A.	138 JAMES ST.	BUFFALO	NY	14210
3970525 - ATMOSPHERIC EFFECTS STILL				
LIN KUO-CHUAN	NO. 10, LANE 177, PEI HSING ST	CHIA		CT
4075063 - SOLAR POWERED DISTILLING OEVICE				
LIN KUO-CHUAN	NO. 10, LANE 177, PEI HSING ST	CHIA I, TAIWAN		CT
4010080 - SOLAR POWEREO OISTILLING OEVICE				
LUKES JEROME A.	1539 - 33RO ST.	OGOEN	UT	84403
4072472 - PROOUCTION OF HIGH PURITY SALT FROM HIGH SULFATE SALT OEPOSITS				
MASSIE LEWIS EVANS	BOX 79	SOLANA BEACH	CA	92075
3880719 - SOLAR STILL WITH REPLACEABLE SOLAR ABSORBING LINER ANO WEIGHT CONTROLLEO FEEO INLET				
OTHMER DONALO F.	333 JAY ST.	BROOKLYN	NY	11201
3928145 - PROCESS FOR PROOUCING POWER, FRESH WATER, ANO FOOO FROM THE SEA ANO SUN				
RUSH MARTIN A.	2501 CINCINNATI-OAYTON ROAO	MIODLETOWN	OH	45042
3986936 - SOLAR HEATED EVAPORATING AND CONDENSING UNIT				
SAOAN ABRAHAM	P.O. BOX 8471	SALT LAKE CITY	UT	84108
4088451 - CONCENTRATION OF UNOERGROUNO BRINES IN SITU BY SOLAR EVAPORATION				
SADAN ABRAHAM	4353 OIANA WAY	SALT LAKE CITY	UT	84117
3966541 - CONCENTRATION OF UNDERGROUNO BRINES IN SITU BY SOLAR EVAPORATION				
SAKAMOTO MINORU	3911 NIOI PL.	HONOLULU	HI	96816
3870605 - COMBINATION SOLAR ANO MANUAL OISTILLER ANO RAIN CATCHER				
SMITH CALVIN S. JR.	8529 BETTY LANE	EL CERRITO	CA	94530
3986938 - OIRECT CONTACT OF LOW-BOILING, WATER-IMMISCIBLE MEDIUM WITH HOT ANO COLD BOOIES OF WATER TO TRANSFER HEAT FOR PURPOSES O F ENERGY P				

UNASSIGNED PATENTS (1/75-12-78) INVENTORS (ALPHA LISTING)

INVENTOR NAME				STREET	CITY	ST	ZIP/CNTRY
TSAY	YAW	JENN		NO. 10, LANE 177, PEI HSING ST	CHIA		CT
4075063 - SOLAR POWERED DISTILLING DEVICE							
TSAY	YAW	JENN		NO. 10, LANE 177, PEI HSING ST	CHIA I, TAIWAN		CT
4010080 - SOLAR POWERED DISTILLING DEVICE							
WELCH	MILTON	C.		P.O. BOX 37	TOOMSUBA	MS	39364
3992246 - SOLAR EVAPORATOR							
ZIEHM	KURT	F.	JR.	P.O. BOX 13	LAND O'LAKES	WI	54540
4077849 - DESALINATION APPARATUS							

PATENTS (1/63-12/78) WITH NEITHER ASSIGNMENT NOR INVENTOR INFORMATION IN DATABASE

3420745 - PISTON-CYLINDER VACUUM DISTILLATION APPARATUS
3441482 - SOLAR ENERGY WATER PURIFICATION APPARATUS
3455790 - ELECTRICALLY CHARGED SPRAY-CONDENSER FOR RECOVERING WATER DISTILLATE
3468762 - DISTILLATION OF SEA WATER USING STEAM TURBINE ELECTRIC GENERATOR AND SOLAR STILL
3501381 - SOLAR STILL WITH FLOATING SLAB-SUPPORTING PARTICULATE RADIANT ENERGY RECEPTOR
3549503 - PROCESS AND APPARATUS FOR THE DISTILLATION OF DISTILLAND DISPLACED BY DISTILLATE
3616270 - PROCESS AND APPARATUS FOR FLASH DISTILLATION WITH PRESSURE AND FLOW OF LIQUID IN PREHEAT CONTROLLED
3653150 - SOLAR DISTILLATION IRRIGATION APPARATUS
3655517 - MOLDED PLASTIC SOLAR STILL
3671404 - PELTIER EFFECT CONCENTRIC STILL WITH HIGH TEMPERATURE HEAT SUPPLYING MEANS
3699006 - VACUUM STILL HAVING HEAT EXCHANGE COILS AND PARTICLE MEANS THEREWITH
3703443 - SOLAR STILL
3747907 - NIGHT STREAM COOLING SYSTEM AND METHOD
3775257 - SOLAR DISTILLATION APPARATUS
3801284 - PELTIER EFFECT DIFFUSION APPARATUS
3846251 - APPARATUS FOR SOLAR DISTILLATION

3071457	3072920	3075891	3076096	3088882	3096257	3099528	3099630	3104210	3104211	3127330	3138546
3159554	3167488	3168450	3174915	3190816	3192133	3193473	3194228	3224948	3232846	3243358	3248529
3257291	3279527	3282327	3290230	3290231	3295591	3300393	3314862	3317406	3330740	3334026	3336206
3337418	3338797	3351536	3351538	3357898	3359183	3361186	3367843	3384558	3394054	3397117	3412466
3414481	3415719	0	0	0	0	0	0	0	0	0	0

SOLAR DISTILLATION AND EVAPORATION CONCENTRATION

PATENTING UPDATE (1/79-10/79)

Patent No.	Assignee & Title
4,134,393	Virgil Stark, 936 5th Ave., New York, NY 10021: Solar Energy Collection
4,135,985	FIAT Societe per Azioni: Desalination of Salt Water By Solar Energy Means
4,137,901	Henry B. Maier, 6 Sealy Ave., Hempstead, L.I. NY 11550: Solar Energy Collecting And Trapping Apparatus For Home Heating Or Cooling
4,138,293	Kurt F. Ziehm, Jr., P.O. Box 13, Land O'Lakes, WI 54540: Desalination Apparatus
4,141,798	A. & T. Development Corporation: Solar Still
4,151,046	Joseph Eidelberg, 8 Clafford Lane, Melville, NY 11746: Double Effect Floating Solar Still Comprising A Submerged Condensing System
4,151,830	Chicago Solar Corporation: Inflated Flexible Solar Collectors
4,154,657	Nancy L. Dennen, 15 Ponderosa Pl., Hewitt, NJ 07421: Dual Dome Structure For Obtaining Heating Through Solar Energy
4,159,228	Avant, Ltd.: Apparatus For Solar Distillation
4,166,769	Joseph Dukess, 931 Greacen Point Rd., Mamaroneck, NY 10543: Solar Heat Apparatus
4,169,791	Waste Mgt., Inc.: Apparatus And Process For Volume Reduction of Aqueous Waste Through Solar Evaporation
4,172,766	Nikolaus Laing, Ingelborg Laing & Oliver Laing, all of Hofener Weg. 35-37 7141 Aldingen, Fed. Rep. of Germany: Solar Energy Collectors And Plants Operated By Them
4,172,767	Walter E. Sear, 235 W. 46th St., NY, NY 10036: Water Purification System

DIRECT CONVERSION OF SOLAR ENERGY TO ELECTRICAL ENERGY

This profile includes devices which convert solar radiant energy directly into electrical energy using photoelectric and thermoelectric principles. Included is material related to the construction of individual electrical and generating units (solar cells), as well as to large scale arrays of such units (solar panels).

ACTIVITY INDICES (1976-1978)

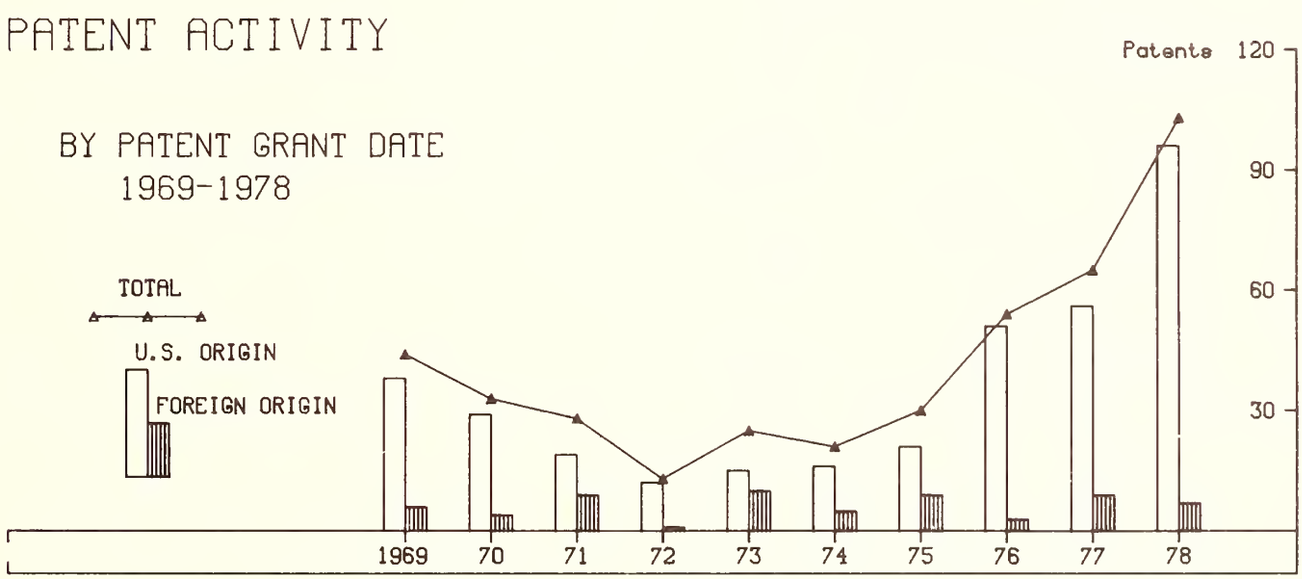
GROWTH	53.4%
FOREIGN SHARE	8.6%
CORPORATE OWNED	70.7%
GOVERNMENT OWNED	11.7%
U.S. OWNED OF FOREIGN	26.3%

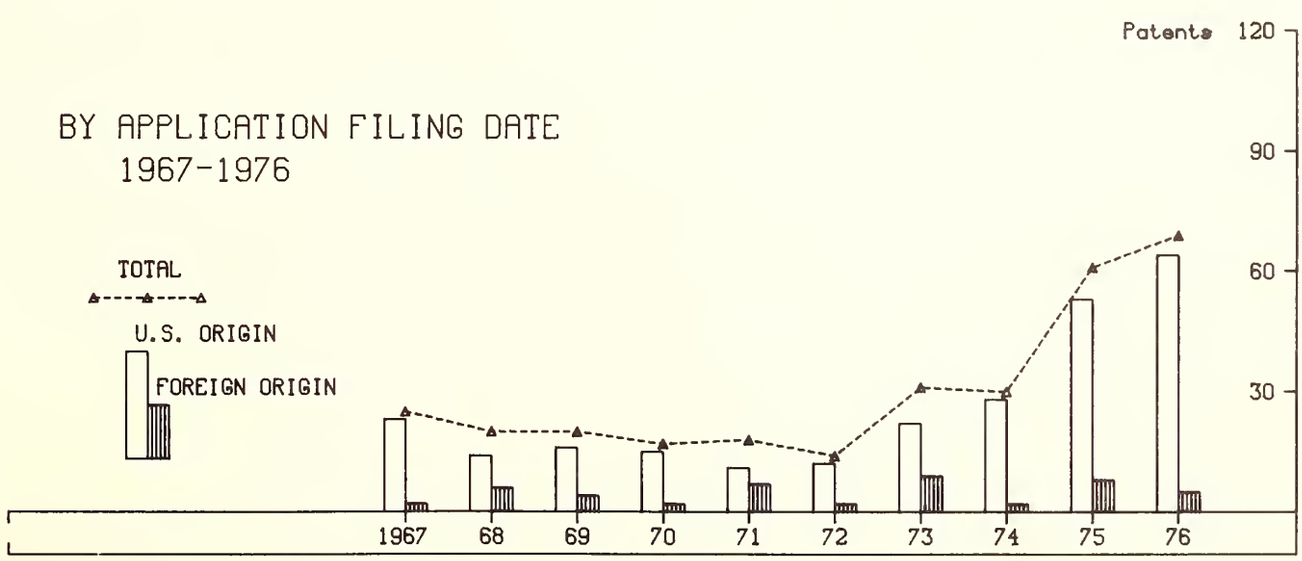
INCLUDED IN THIS PROFILE ARE ALL OF THE PATENTS FROM:

Class 136, Subclass 206
Class 429, Subclass 111

AND SELECTED PATENTS FROM:

Class 29, Subclass 572
Class 136, Subclass 89
Class 244, Subclasses 168, 173
Class 250, Subclasses 211J, 212,215
Class 310, Subclasses 306, 307,
Class 320, Subclasses 2,3,5,6,9,14,15, 23,30,35,39,40, DIG 1
Class 322, Subclasses 2R, 2A
Class 57, Subclasses 2,29,30,59





SOLAR ENERGY - DIRECT CONVERSION OF SOLAR ENERGY TO ELECTRICAL ENERGY

PATENT ACTIVITY (1963-1978) BY DATE OF PATENT GRANT

	NUMBER OF PATENTS															
	63-64	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	TOTAL
TOTAL	29	20	25	25	37	44	33	28	13	25	21	30	54	65	103	552
U.S. ORIGIN	27	19	22	24	33	38	29	19	12	15	16	21	51	56	96	478
FOREIGN ORIGIN	2	1	3	1	4	6	4	9	1	10	5	9	3	9	7	74
GERMANY	1				1		1	3	1	5	1	3	1	2	3	22
FRANCE			2		2	2		2		2	2	5		1	2	20
JAPAN						1	2	1		2	1		2	3	2	14
UNITED KINGDOM	1			1		1		2				1		1		7
NETHERLANDS			1			1	1	1		1	1					6
CANADA		1														1
SOUTH AFRICA														1		1
ISRAEL														1		1
U.S.S.R.						1										1
NORWAY					1											1
U.S. ORIGIN	27	19	22	24	33	38	29	19	12	15	16	21	51	56	96	478
U.S. CORP. OWNED	23	15	18	15	20	24	22	9	6	9	13	13	35	41	64	327
U.S. GOVT. OWNED	3	3	3	3	8	11	7	9	6	6	2	6	10	3	12	92
U.S. INDIV. OWNED	1	1	1	6	5	3		1			1	2	6	12	20	59
FOREIGN OWNED																
FOREIGN ORIGIN	2	1	3	1	4	6	4	9	1	10	5	9	3	9	7	74
U.S. OWNED			3			2	1	3		1	3	1	1	1	3	19
FOREIGN OWNED	2	1		1	4	4	3	6	1	9	2	8	2	8	4	55
FOREIGN CORP.	1			1	2	2	3	6		9	2	7	2	6	4	45
FOREIGN GOVT.														1		1
FOREIGN INDIV.	1	1			2	2			1			1		1		9

SOLAR ENERGY - DIRECT CONVERSION OF SOLAR ENERGY TO ELECTRICAL ENERGY

PATENT ACTIVITY (PATENTS GRANTED 1/67-12/78) BY DATE OF PATENT APPLICATION

	NUMBER OF PATENTED APPLICATIONS															
	PRE 65	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	TOTAL
TOTAL	47	27	38	25	20	20	17	18	14	31	30	61	69	53	8	478
U.S. ORIGIN	44	21	32	23	14	16	15	11	12	22	28	53	64	47	8	410
FOREIGN ORIGIN	3	6	6	2	6	4	2	7	2	9	2	8	5	6		68
GERMANY			1	1	2	3	1	3	1	3		2	2	2		21
FRANCE	1	4			1			3	1	3	2	1	1	1		18
JAPAN		1	2	1			1	1		1		3	2	2		14
UNITED KINGDOM	1		1		1	1				1		1				6
NETHERLANDS			2		2					1						5
CANADA																
SOUTH AFRICA												1				1
ISRAEL														1		1
U.S.S.R.		1														1
NORWAY	1															1
U.S. ORIGIN	44	21	32	23	14	16	15	11	12	22	28	53	64	47	8	410
U.S. CORP. OWNED	32	12	22	15	8	8	8	8	7	15	17	33	48	31	7	271
U.S. GOVT. OWNED	5	5	8	7	6	8	6	3	4	5	6	7	6	6	1	83
U.S. INDIV. OWNED	7	4	2	1			1		1	2	5	13	10	10		56
FOREIGN OWNED																
FOREIGN ORIGIN	3	6	6	2	6	4	2	7	2	9	2	8	5	6		68
U.S. OWNED			3		4				1	3		1	1	3		16
FOREIGN OWNED	3	6	3	2	2	4	2	7	1	6	2	7	4	3		52
FOREIGN CORP.	2	4	3	1	2	3	2	7	1	6	1	5	4	3		44
FOREIGN GOVT.												1				1
FOREIGN INDIV.	1	2		1		1					1	1				7

DIRECT CONVERSION OF SOLAR ENERGY TO ELECTRICAL ENERGY

ASSIGNEES WITH 2 OR MORE PATENTS (1/69 - 12/78)

UNITED STATES OF AMERICA, NATIONAL AERONAUTICS AND SPACE ADM	43
TRW INC.	17
COMMUNICATIONS SATELLITE CORP.	15
HUGHES AIRCRAFT COMPANY	14
WESTINGHOUSE ELECTRIC CORP.	13
UNITED STATES OF AMERICA, NAVY	11
RCA CORPORATION	11
OPTEL CORPORATION	10
U.S. PHILIPS CORPORATION	9
LICENTIA PATENT-VERWALTUNGS-GMBH	9
BELL TELEPHONE LABORATORIES INCORPORATED	9
MOBIL TYCO SOLAR ENERGY CORP.	8
UNITED STATES OF AMERICA, AIR FORCE	7
TEXAS INSTRUMENTS, INCORPORATED	7
SOLAREX CORPORATION	6
MASSACHUSETTS INSTITUTE OF TECHNOLOGY	6
UNITED STATES OF AMERICA, DEPARTMENT OF ENERGY	6
UNITED STATES OF AMERICA, ARMY	5
SOCIETE ANONYME DE TELECOMMUNICATIONS	5
AMERICAN CYANAMID COMPANY	4
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GLOBE-UNION INC.	4
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GTE LABORATORIES INCORPORATED	3
SENSOR TECHNOLOGY, INC.	3
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MONSANTO COMPANY	2
BOLKOW GESELLSCHAFT MIT BESCHRANKTER HAFTUNG	2
PHOTON POWER, INC.	2
D.H. BALDWIN COMPANY	2
RAYTHEON COMPANY	2
GENERAL DYNAMICS CORPORATION	2
ROCKWELL INTERNATIONAL CORPORATION	2
INNOTECH CORPORATION	2
SHARP KABUSHIKI KAISHA	2
CENTRE NATIONAL D ETUDES SPATIALES	2
SOTEC CORPORATION	2
GENERAL ELECTRIC COMPANY	2
TELEFUNKEN PATENTVERWERTUNGSGESELLSCHAFT MBH	2
EASTMAN KODAK COMPANY	2

ASSIGNED PATENTING(1/69 - 12/78) - - ALPHA LISTING

AEROJET-GENERAL CORPORATION
3427200 - LIGHT CONCENTRATOR TYPE PHOTOVOLTAIC PANEL HAVING CLAMPING MEANS FOR RETAINING PHOTOVOLTAIC CELL

AERONUTRONIC FORD CORPORATION (FORMERLY PHILCO-FORD CORP.)
3844843 - SOLAR CELL WITH ORGANIC SEMICONDUCTOR CONTAINED IN A GEL
3900945 - ORGANIC SEMICONDUCTOR SOLAR CELL

AGENCE NATIONALE DE VALORISATION DE LA RECHERE (ANVAR)
4046594 - SOLAR BATTERY

ALLIED CHEMICAL CORPORATION
4011149 - PHOTOELECTROLYSIS OF WATER BY SOLAR RADIATION
4090933 - PHOTOELECTROLYSIS OF WATER BY SOLAR RADIATION
4094751 - PHOTOCHEMICAL DIODES

AMERICAN CYANAMID COMPANY
3708220 - HIGH CONDUCTIVITY ELECTROLYTE GEL MATERIALS
3811953 - LIGHT-TRANSMITTING ELECTRICALLY CONDUCTING CADMIUM STANNATE AND METHODS OF PRODUCING SAME
3957029 - GREENHOUSE WINDOW FOR SOLAR HEAT ABSORBING SYSTEMS DERIVED FROM CD/2\ SND/4\
4048372 - COATING OF CADMIUM STANNATE FILMS ONTO PLASTIC SUBSTRATES

AMERICAN FIRE APPARATUS CO.
3713893 - INTEGRATED SOLAR CELL ARRAY

AMP INCORPORATED
3999287 - METHOD OF MAKING A SWITCH HAVING A DIODE MOUNTING FEATURE

ARCO SOLAR, INC.
4105471 - SOLAR CELL WITH IMPROVED PRINTED CONTACT AND METHOD OF MAKING THE SAME

ARTHUR D. LITTLE INC.
3781647 - METHOD AND APPARATUS FOR CONVERTING SOLAR RADIATION TO ELECTRICAL POWER

ATLANTIC RICHFIELD COMPANY
4116718 - PHOTOVOLTAIC ARRAY INCLUDING LIGHT DIFFUSER
4127425 - LUMINESCENT SOLAR COLLECTOR
4130445 - LIGHT COLLECTOR

BATTELLE DEVELOPMENT CORPORATION
4101341 - CDSE-SNSE PHOTOVOLTAIC CELL

BELL TELEPHONE LABORATORIES INCORPORATED
3978510 - HETEROJUNCTION PHOTOVOLTAIC DEVICES EMPLOYING I-III-VI COMPOUNDS
3982265 - DEVICES CONTAINING ALUMINUM-V SEMICONDUCTOR AND METHOD FOR MAKING
3988172 - ANNEALING SOLAR CELLS OF INP/CDS
4074305 - GAAS LAYERS AS CONTACTS TO THIN FILM SEMICONDUCTOR LAYERS
4082602 - PHOTOVOLTAIC CELL MANUFACTURE
4084044 - LIQUID-SEMICONDUCTOR PHOTOCELL USING SINTERED ELECTRODE
4118548 - METHOD OF OPERATING A LIQUID-SEMICONDUCTOR JUNCTION PHOTOCELL
4121238 - METAL OXIDE/INDIUM PHOSPHIDE DEVICES
4127449 - LIQUID-SEMICONDUCTOR JUNCTION PHOTOCELLS

ASSIGNED PATENTING(1/69 - 12/78) - - ALPHA LISTING

BOEING COMPANY
3630020 - SOLAR ORIENTATION DEVICE
3973996 - DIFFUSION WELDED SOLAR CELL ARRAY
4097309 - THERMALLY ISOLATED SOLAR CELL CONSTRUCTION

BOLKOW GESELLSCHAFT MIT BESCHRANKTER HAFTUNG
3510086 - OUTRIGGER FOR SPACE MISSILES
3559919 - ACTIVE COMMUNICATION SATELLITE

BRITISH AIRCRAFT CORPORATION LIMITED
4014617 - COUPLING ASSEMBLIES

CALIFORNIA INSTITUTE OF TECHNOLOGY
4090213 - INDUCED JUNCTION SOLAR CELL AND METHOD OF FABRICATION

CARNEGIE-MELLON UNIVERSITY
3993533 - METHOD FOR MAKING SEMICONDUCTORS FOR SOLAR CELLS

CENTRE NATIONAL D ETUDES SPATIALES
3735942 - SPACE STATION WITH SOLAR GENERATORS
3735943 - SPACE STATION WITH SOLAR GENERATORS

CLEVITE CORPORATION
3571915 - METHOD OF MAKING AN INTEGRATED SOLAR CELL ARRAY

COMMISSARIAT A L ENERGIE ATOMIQUE
4053326 - PHOTOVOLTAIC CELL

COMMUNICATIONS SATELLITE CORP.
3544041 - DEPLOYABLE FLEXIBLE SOLAR ARRAY
3769558 - SURFACE INVERSION SOLAR CELL AND METHOD OF FORMING SAME
3785590 - SPACECRAFT BODY WITH ROLLER MECHANISM FOR DEPLOYABLE-RETRACTABLE THIN FILM SOLAR ARRAY
3811954 - FINE GEOMETRY SOLAR CELL
3819417 - MECHANICALLY INTERLACED AND ELECTRICALLY INTERCONNECTED SILICON SOLAR CELLS
3849880 - SOLAR CELL ARRAY
3888698 - INFRARED-TRANSPARENT SOLAR CELL
3895975 - METHOD FOR THE POST-ALLOY DIFFUSION OF IMPURITIES INTO A SEMICONDUCTOR
3904453 - FABRICATION OF SILICON SOLAR CELL WITH ANTI REFLECTION FILM
3907595 - SOLAR CELLS WITH INCORPORATE METAL LEYER
3922774 - TANTALUM PENTOXIDE ANTI-REFLECTIVE COATING
3943003 - PADDED SOLAR CELL CONTACTS
3949463 - METHOD OF APPLYING AN ANTI-REFLECTIVE COATING TO A SOLAR CELL
3977905 - SOLAR CELL WITH NIOBIUM PENTOXIDE ANTI-REFLECTIVE COATING
4053327 - LIGHT CONCENTRATING SOLAR CELL COVER

CORNELL AERONAUTICAL LABORATORY, INC.
3433677 - FLEXIBLE SHEET THIN-FILM PHOTOVOLTAIC GENERATOR

CORNELL RESEARCH FOUNDATION INC.
4094703 - SOLAR ENERGY CONVERTER

ASSIGNED PATENTING(1/69 - 12/78) - - ALPHA LISTING

CSF-COMPAGNIE GENERALE DE TELEGRAPHIE SANS FIL
3431439 - THERMIONIC ENERGY CONVERTER

D. H. BALDWIN COMPANY
3880633 - METHOD OF COATING A GLASS RIBBON ON A LIQUID FLOAT BATH
3902920 - PHOTOVOLTAIC CELL

DICKSON ELECTRONICS CORPORATION
3488506 - SOLAR CELL DELAY WITH TRANSISTOR FEEDBACKS

DOW CHEMICAL COMPANY
3877995 - POTASSIUM BORATE GLASS COMPOSITIONS

DOW CORNING CORPORATION
3953876 - SILICON SOLAR CELL ARRAY

EASTMAN KODAK COMPANY
4035197 - BARRIER TYPE PHOTOVOLTAIC CELLS WITH ENHANCED OPEN-CIRCUIT VOLTAGE, AND PROCESS OF MANUFACTURE
4125414 - ORGANIC PHOTOVOLTAIC ELEMENTS

ESB INCORPORATED
3713896 - SEAL FOR ELECTROCHEMICAL CELLS

EXXON RESEARCH + ENGINEERING CO.
3989542 - PHOTOGALVANIC DEVICE
4064522 - HIGH EFFICIENCY SELENIUM HETEROJUNCTION SOLAR CELLS
4127738 - PHOTOVOLTAIC DEVICE CONTAINING AN ORGANIC LAYER

FERRANTI LIMITED
3912539 - SOLAR CELLS

FRAUNHOFER-GESELLSCHAFT ZUR FORDERUNG DER ANGEWANDTEN FORSCH
4110123 - APPARATUS FOR CONVERTING LIGHT ENERGY INTO ELECTRICAL ENERGY

FUTABA DENSHI KOGYO KABUSHIKI KAISHA
4066527 - METHOD OF PRODUCING SEMICONDUCTOR DEVICE

GENERAL DYNAMICS CORPORATION
4015653 - PANEL DEPLOYMENT SYSTEM
4057476 - THIN FILM PHOTOVOLTAIC DIODES AND METHOD FOR MAKING SAME

GENERAL ELECTRIC COMPANY
3561405 - SECONDARY FUEL SYSTEM FOR A SUPPLEMENTARY FIRED HEAT RECOVERY STEAM-GENERATOR
3936319 - SOLAR CELL

GENERAL SOLAR POWER CORPORATION
4009051 - SOLAR POWER PACK APPARATUS

GENERAL TRAILER COMPANY, INC.
3993326 - VEHICLE WITH SELF-STEERING TRAILER

ASSIGNED PATENTING(1/69 - 12/78) - - ALPHA LISTING

GLOBE-UNION INC.
3454774 - ELECTRICAL CONNECTOR FOR SEMICONDUCTOR DEVICES
3462311 - SEMI-CONDUCTOR DEVICE HAVING IMPROVED RESISTANCE TO RADIATION DAMAGE
3471924 - PROCESS FOR MANUFACTURING INEXPENSIVE SEMICONDUCTOR DEVICES
3493822 - SOLID STATE SOLAR CELL WITH LARGE SURFACE FOR RECEIVING RADIATION

GTE LABORATORIES INCORPORATED
4127466 - PHOTOELECTROCHEMICAL METAL PLATING AND PURIFICATION SYSTEM
4127784 - LIGHT ACTIVATED SOLID STATE MICROWAVE GENERATORS
4128704 - PHOTOELECTROCHEMICAL ENERGY STORAGE SYSTEM

HITACHI, LTD.
3858233 - LIGHT-RECEIVING SEMICONDUCTOR DEVICE

HUGHES AIRCRAFT COMPANY
3490950 - SELECTIVE CONVERSION OF SOLAR ENERGY WITH RADIATION RESISTANT SOLAR ENERGY CONVERTER ARRAY
3491969 - MOTION SENSING SYSTEM HAVING A COHERENT LIGHT BEAM AS A REFERENCE
3722840 - SPIN STABILIZED VEHICLE AND SOLAR CELL ARRANGEMENT THEREFOR
3758051 - VELOCITY CONTROL AND ORIENTATION OF A SPIN-STABILIZED BODY
3809337 - SPIN STABILIZED VEHICLE AND SOLAR CELL ARRANGEMENT THEREFOR
3863870 - SPIN STABILIZED VEHICLE AND SOLAR CELL ARRANGEMENT THEREFOR
3903427 - SOLAR CELL CONNECTIONS
3903428 - SOLAR CELL CONTACT DESIGN
3973745 - SOLAR CELL ARRANGEMENT FOR A SPIN STABILIZED VEHICLE
3993505 - INTERCONNECTOR FOR COMPONENTS SUCH AS SOLAR CELLS OR THE LIKE
4107723 - HIGH BANDGAP WINDOW LAYER FOR GAAS SOLAR CELLS AND FABRICATION PROCESS THEREFOR
4108684 - LARGE GRAIN THIN FILM POLYCRYSTALLINE P-INP/N-CDS SOLAR CELL
4113531 - PROCESS FOR FABRICATING POLYCRYSTALLINE INP-CDS SOLAR CELLS
4128733 - MULTIJUNCTION GALLIUM ALUMINUM ARSENIDE-GALLIUM ARSENIDE-GERMANIUM SOLAR CELL AND PROCESS FOR FABRICATING SAME

INNOTECH CORPORATION
4016586 - PHOTOVOLTAIC HETEROJUNCTION DEVICE EMPLOYING A WIDE BANDGAP MATERIAL AS AN ACTIVE LAYER
4024558 - PHOTOVOLTAIC HETEROJUNCTION DEVICE EMPLOYING A GLASSY AMORPHOUS MATERIAL AS AN ACTIVE LAYER

INTERNATIONAL BUSINESS MACHINES CORPORATION
3675026 - CONVERTER OF ELECTROMAGNETIC RADIATION TO ELECTRICAL POWER
4005698 - PHOTON ENERGY CONVERTER
4062038 - RADIATION RESPONSIVE DEVICE
4062698 - PHOTOELECTRICAL CONVERTER

INTERNATIONAL RECTIFIER CORPORATION
3422527 - METHOD OF MANUFACTURE OF HIGH VOLTAGE SOLAR CELL
3483039 - SILICON CELL CONSTRUCTION AND METHOD OF MANUFACTURE THEREFOR

ION PHYSICS CORPORATION
3539883 - ANTI-REFLECTION COATINGS FOR SEMICONDUCTOR DEVICES

ITEK CORPORATION
3527619 - SOLAR CELL ARRAY

ASSIGNEO PATENTING(1/69 - 12/78) - - ALPHA LISTING

JOHNSON CONTROLS, INC.
4083356 - SOLAR ENERGY APPARATUS

KABUSHIKI KAISHA SUWA SEIKOSHA
3731474 - CHARGING CIRCUIT FOR WRIST WATCH HAVING SOLAR BATTERY

KAPTRON, INC.
3985116 - HIGH EFFICIENCY SOLAR PANEL

KEWANNE INOUSTRIES, INC.
3442007 - PROCESS PHOTOVOLTAIC CELL
3472690 - PROCESS OF PREPARING A FLEXIBLE REAR WALL PHOTOVOLTAIC CELL
3480473 - METHOD OF PRODUCING POLYCRYSTALLINE PHOTOVOLTAIC CELLS

LICENTIA PATENT-VERWALTUNGS-GMBH
3574925 - SOLDERING PROCESS
3736180 - METHOD OF PROOUCING SOLAR CELLS
3772768 - METHOO OF PROOUCING A SOLAR CELL
3772770 - METHOD OF MANUFACTURING A SEMICONOUCTOR OEVICE
3778312 - SOLAR CELL GENERATOR FOR FLIGHT MISSIONS IN THE VICINITY OF THE SUN
3802924 - THIN SOLAR CELL WITH RIM ANO METAL CONTACT ON REVERSE FACE
3887935 - INTEGRATEO SEMICONOUCTOR ARRANGEMENT INCLUOING SOLAR CELL ANO A SCHOTTKY OIOOE
4009054 - TERRESTRIAL SOLAR CELL GENERATOR
4043834 - FLEXIBLE SOLAR GENERATOR PANEL

LITTON BUSINESS SYSTEMS INC.
4017725 - SOLAR POWEREO PORTABLE CALCULATOR

LOCKHEED CORPORATION
3714119 - ZINC-SILOXANE POLYMER ANO COATING ANO METHOD FOR MAKING THE SAME

LOCKHEEO MISSILES + SPACE COMPANY, INC.
3658596 - FLEXIBLE SOLAR CELL MOOULAR ASSEMBLY

MARTIN-MARIETTA CORPORATION
3489915 - COMBINEO SOLAR ARRAY BATTERY CHARGER

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
3549960 - THERMO-PHOTOVOLTAIC CONVERTER HAVING BACK-SURFACE JUNCTIONS
4042417 - PHOTOVOLTAIC SYSTEM INCLUOING A LENS STRUCTURE
4086485 - SOLAR-RAOIATION COLLECTION APPARATUS WITH TRACKING CIRCUITRY
4110122 - HIGH-INTENSITY, SOLID-STATE-SOLAR CELL OEVICE
4128732 - SOLAR CELL
4129458 - SOLAR-CELL ARRAY

MATSUSHITA ELECTRIC INOUSTRIAL CO., LTD.
3492167 - PHOTOVOLTAIC CELL ANO METHOO OF MAKING THE SAME
3520732 - PHOTOVOLTAIC CELL ANO PROCESS OF PREPARATION OF SAME
3568306 - METHOO OF MAKING PHOTOVOLTAIC OEVICE BY ELECTRO- PLATING

MESSERSCHMITT-BOLKOW-BLOHM GMBH
3606211 - OUTRIGGER CONSTRUCTION
3733758 - MECHANISM FOR UNFOLOING ACCOROIAN-LIKE FOLOEO STRUCTURAL ELEMENTS

ASSIGNED PATENTING(1/69 - 12/78) - - ALPHA LISTING

MESSERSCHMITT-BOLKOW-BLOHM GMBH (CONTINUED)
3977904 - SEMI-CONDUCTOR BATTERY

MINNESOTA MINING AND MANUFACTURING COMPANY
3619098 - PHOTO-FLASH UNIT

MOBIL TYCO SOLAR ENERGY CORP.
3976508 - TUBULAR SOLAR CELL DEVICES
3982260 - LIGHT SENSITIVE ELECTRONIC DEVICES
4019924 - SOLAR CELL MOUNTING AND INTERCONNECTING ASSEMBLY
4045246 - SOLAR CELLS WITH CONCENTRATORS
4056404 - FLAT TUBULAR SOLAR CELLS AND METHOD OF PRODUCING SAME
4078944 - ENCAPSULATED SOLAR CELL ASSEMBLY
4078945 - ANTI-REFLECTIVE COATING FOR SILICON SOLAR CELLS
4095329 - MANUFACTURE OF SEMICONDUCTOR RIBBON AND SOLAR CELLS

MONSANTO COMPANY
3462323 - PROCESS FOR THE PREPARATION OF COMPOUND SEMICONDUCTORS
3496024 - PHOTOVOLTAIC CELL WITH A GRADED ENERGY GAP

MONSANTO RESEARCH CORPORATION
4003770 - PLASMA SPRAYING PROCESS FOR PREPARING POLYCRYSTALLINE SOLAR CELLS

MOTOROLA INC.
4004949 - METHOD OF MAKING SILICON SOLAR CELLS
4045245 - SOLAR CELL PACKAGE
4131485 - SOLAR ENERGY COLLECTOR AND CONCENTRATOR
4131488 - METHOD OF SEMICONDUCTOR SOLAR ENERGY DEVICE FABRICATION

NCR CORPORATION
3586541 - PHOTOSENSITIVE DEVICES COMPRISING ALUMINUM FOIL

NEW ENGLAND INSTITUTE, INC.
3935031 - PHOTOVOLTAIC CELL WITH ENHANCED POWER OUTPUT

NORTH AMERICAN PHILIPS CORPORATION
3436625 - SEMICONDUCTOR DEVICE COMPRISING III-V EPITAXIAL DEPOSIT ON SUBSTITUTIONAL III-V SUBSTRATE

OPTEL CORPORATION
4076904 - SOLID STATE PHOTOGALVANIC DEVICE UTILIZING SEA WATER AS AN ELECTROLYTE
4080488 - DYE-TITANIUM DIOXIDE PHOTOGALVANIC CELL
4084043 - PHOTOGALVANIC CELL HAVING A CHARGE STORAGE LAYER WITH VARYING PERFORMANCE CHARACTERISTICS
4085257 - RADIANT ENERGY CONVERTER HAVING STORAGE
4086398 - MULTI-COMPARTMENT PHOTOGALVANIC CELL
4097655 - PHOTOGALVANIC CELL USING A TRANSPARENT CONDUCTING ELECTRODE
4115631 - ENERGY STORING PHOTOGALVANIC CELL HAVING DIELECTRIC OVERCOATING
4117210 - PHOTOGALVANIC CELL HAVING TRANSPARENT PHOTOACTIVE TIO/2 \ THIN FILM
4118546 - TRIPLE ELECTRODE PHOTOGALVANIC CELL WITH ENERGY STORAGE CAPABILITY
4118547 - THIN FILM PHOTOGALVANIC CELL

OPTICAL COATING LABORATORY, INC.
4055442 - SILICON SOLAR CELL CONSTRUCTION HAVING TWO LAYER ANTI-REFLECTION COATING

ASSIGNEO PATENTING(1/69 - 12/78) - - ALPHA LISTING

PHASER TELEPROPULSION, INC.
4078747 - ORBITING SOLAR POWER STATION

PHOTON POWER, INC.
4086101 - PHOTOVOLTAIC CELLS
4104420 - PHOTOVOLTAIC CELL

POLAROIO CORPORATION
4060426 - TIN INOIUM OXIOE ANO POLYVINYLCARBAZOLE LAYEREO POLARIZEO PHOTOVOLTAIC CELL

PURDUE RESEARCH FOUNOATION
4022950 - REVERSIBLE PHOTOGALVANIC CELLS FOR THE CONVERSION OF SOLAR RADIATION INTO ELECTRICITY

RAYTHEON CORPORATION
3933323 - SOLIO STATE SOLAR TO MICROWAVE ENERGY CONVERTER SYSTEM AND APPARATUS
3989994 - SPACE ORIENTEO MICROWAVE POWER TRANSMISSION SYSTEM

RCA CORPORATION
3483038 - INTEGRATEO ARRAY OF THIN-FILM PHOTOVOLTAIC CELLS ANO METHOO OF MAKING SAME
3948468 - REPLACEABLE SOLAR ARRAY PANELS
3988167 - SOLAR CELL DEVICE HAVING IMPROVEO EFFICIENCY
3990101 - SOLAR CELL OEVICE HAVING TWO HETEROJUNCTIONS
3997830 - SATELLITE BATTERY RECONOITIONING SYSTEM ANO METHOO
3999283 - METHOO OF FABRICATING A PHOTOVOLTAIC OEVICE
4061555 - WATER PHOTOLYSIS APPARATUS
4070206 - POLYCRYSTALLINE OR AMORPHOUS SEMICONDUCTOR PHOTOVOLTAIC OEVICE HAVING IMPROVEO COLLECTION EFFICIENCY
4109271 - AMORPHOUS SILICON-AMORPHOUS SILICON CARBIOE PHOTOVOLTAIC OEVICE
4124464 - GROOVEO N-TYPE TIO/2 \ SEMICONOUCTOR ANODE FOR A WATER PHOTOLYSIS APPARATUS
4126150 - PHOTOVOLTAIC DEVICE HAVING INCREASEO ABSORPTION EFFICIENCY

RENE VILLASENOR OE RIVAS
3824448 - CONTACT POTENTIAL GENERATOR SYSTEM

RESEARCH CORPORATION
3510714 - SOLAR ENERGY CONVERT WITH TROUGH-SHAPEO CATHODE ANO SHIELOEO, PLANAR ANOOE

RHO SIGMA CORPORATION
4015116 - MEASUREMENT OF SOLAR RAOIATION

ROCKWELL INTERNATIONAL CORPORATION
3525483 - OEPLOYMENT MECHANISM
3617376 - ANTISUBLIMATION COATING ANO METHOO FOR THERMO- ELECTRIC MATERIALS

ROWENTA-WERKE GMBH
3860863 - APPARATUS FOR CONVERTING LIGHT ENERGY INTO ELECTRICAL ENERGY

SANDERS ASSOCIATES INC.
4013885 - SOLAR ENERGY SUN TRACKER

SEMICON, INC.
4082570 - HIGH INTENSITY SOLAR ENERGY CONVERTER

ASSIGNED PATENTING(1/69 - 12/78) - - ALPHA LISTING

SENSOR TECHNOLOGY, INC.
3990914 - TUBULAR SOLAR CELL
4052782 - TUBULAR SOLAR CELL ANO METHOD OF MAKING SAME
4081820 - COMPLEMENTARY PHOTOVOLTAIC CELL

SES, INCORPORATEO
4127424 - PHOTOVOLTAIC CELL ARRAY

SHARP KABUSHIKI KAISHA
3956017 - OPTOELECTRIC TRANSDUCER
4029518 - SOLAR CELL

SIERRACIN CORPORATION
4067764 - METHOO OF MANUFACTURE OF SOLAR CELL PANEL

SILICON MATERIAL, INC.
4062102 - PROCESS FOR MANUFACTURING A SOLAR CELL FROM A REJECT SEMICONOUCTOR WAFER

SINGER-GENERAL PRECISION INC.
3447234 - PHOTOCONOUCTIVE THIN FILM CELL RESPONOING TO A BROAO SPECTRAL RANGE OF LIGHT INPUT

SOCIETE ANONYME OE TELECOMMUNICATIONS
3427459 - TRANSOUCER HAVING A CONVERSION CHARACTERISTIC OF A PREOETERMINEO FORMATION
3793082 - PROCESS FOR MAKING ELECTRICAL CONTACTS OF SOLAR BATTERIES ANO SOLAR BATTERIES MAOE ACCOROING TO THIS PROCESS
3884779 - METHOO FOR THE CONTROLLEO FORMATION OF THE LAYER OF COPPER SULPHIOE OF A CAOMIUM SULPHIOE PHOTOCELL
3887995 - PROCESS OF MANUFACTURE OF SOLAR CELLS
3928073 - SOLAR CELLS

SOCIETE NATIONALE INOUSTRIELLE AEROSPATIALE
4101101 - SOLAR GENERATOR

SOLAR DYNAMICS CORPORATION
4003756 - OEVICE FOR CONVERTING SUNLIGHT INTO ELECTRICITY

SOLAREX CORPORATION
3990097 - SILICON SOLAR ENERGY CELL HAVING IMPROVEO BACK CONTACT ANO METHOD FORMING SAME
4056405 - PANEL FOR SOLAR ENERGY CELLS
4056879 - METHOO OF FORMING SILICON SOLAR ENERGY CELL HAVING IMPROVEO BACK CONTACT
4057439 - SOLAR PANEL
4058418 - FABRICATION OF THIN FILM SOLAR CELLS UTILIZING EPITAXIAL OEPOSITION ONTO A LIQUIO SURFACE TO OBTAIN LATERAL GROWTH
4116207 - SOLAR PANEL WITH MAT BASE MEMBER

SONY CORPORATION
3990100 - SEMICONOUCTOR DEVICE HAVING AN ANTIREFLECTIVE COATING

SOTEC CORPORATION
4042447 - CRYSTALLIZING A LAYER OF SILICON ON A SOOIUM THALLIUM TYPE CRYSTALLINE ALLOY SUBSTRATE
4115625 - SOOIUM THALLIUM TYPE CRYSTAL ON CRYSTALLINE LAYER

SPECTROLAB
3489615 - SOLAR CELLS WITH INSULATED WRAPAROUNO ELECTROOES

ASSIGNEO PATENTING(1/69 - 12/78) - - ALPHA LISTING

SUPERIOR OIL COMPANY
4042758 - PHOTOCHEMICAL CELL

TELEFUNKEN PATENTVERWERTUNGSGESELLSCHAFT MBH
3686036 - SOLAR CELL WITH METAL LAYEREO CONTACT AND METHOO OF MANUFACTURE
3905836 - PHOTOELECTRIC SEMICONDUCTOR OEVICES

TEXAS INSTRUMENTS, INCORPORATEO
3441453 - METHOO FOR MAKING GRADEO COMPOSITION MIXEO COMPOUNO SEMICONOUCTOR MATERIALS
3969163 - VAPOR OEPOSITION METHOO OF FORMING LOW COST SEMICONOUCTOR SOLAR CELLS INCLUOING RECONSTITUTION OF THE REACTEO GASES
3969746 - VERTICAL MULTIJUNCTION SOLAR CELL
3998659 - SOLAR CELL WITH SEMICONOUCTOR PARTICLES ANO METHOO OF FABRICATION
4021323 - SOLAR ENERGY CONVERSION
4101351 - PROCESS FOR FABRICATING INEXPENSIVE HIGH PERFORMANCE SOLAR CELLS USING OOPED OXIOE JUNCTION ANO INSITU ANTI-REFLECTION C OATINGS
4119768 - PHOTOVOLTAIC BATTERY

TEXTRON INC.
3450568 - SOLAR CELL WITH WRAP-AROUNO ELECTROOES
3502507 - SOLAR CELLS WITH EXTENOEO WRAP-AROUNO ELECTROOES
3575721 - SOLAR CELL ARRAYS ANO CONNECTORS

TIOELANO SIGNAL CORPORATION
4097308 - GLASS ENCLOSEO SOLAR CELL PANEL

TIMEX CORPORATION
3509712 - PHOTOELECTRIC CONVERSION SYSTEM IN A HOROLOGICAL OEVICE

TOKYO SHIBAURA ELECTRIC CO., LTO.
3717413 - SUN SENSING SYSTEM FOR A FLYING BOOY

TOM SWIFT ENTERPRISES, INC.
4126149 - SOLAR ENERGY ELECTRICAL CONVERSION APPARATUS

TRANCOA CHEMICAL CORPORATION
3444100 - RADIATION RESISTANT SEMICONOUCTOR GRAOE SILICON CONTAINING A METAL OXIOE

TRUSTEES OF BOSTON UNIVERSITY
4052536 - ELECTROLYTES WHICH ARE USEFUL IN SOLAR ENERGY CONVERSION

TRW INC.
3459597 - SOLAR CELLS WITH FLEXIBLE OVERLAPPING BIFURCATEO CONNECTOR
3477662 - PNEUMATIC TUBE DEPLOYMENT MEANS, ANO SOLAR CELL THEREWITH
3493765 - SPACECRAFT ATTITUOE OETECTOR UTILIZING SOLAR SENSORS ANO SUMMATION OF PREOETERMINEO SIGNALS OERIVEO THEREFROM
3493837 - BATTERY CHARGE CONTROL SYSTEM
3515594 - RAOIANT ENERGY ORIVEN ORIENTATION SYSTEM
3532299 - OEPLOYABLE SOLAR ARRAY
3548211 - ROTATING RAOIATION SENSOR
3562020 - SOLAR CELL ASSEMBLY
3677508 - FOLDING DEPOLYABLE PANEL STRUCTURE HAVING ROLL-UP RETAINING SPRING FOR STOWAGE
3690080 - SOLAR ARRAY WITH SELF-ERECTING, SELF-RIGIOIZING ROLL-UP SHEETS
3698958 - SOLAR PANEL

ASSIGNEO PATENTING(1/69 - 12/78) - - ALPHA LISTING

TRW INC. (CONTINUED)
3783029 - SELF-ERECTING ANO RIGIOIZING OEPLOYABLE PANEL ANO PANEL ASSEMBLY
3817477 - OEPLOYABLE ANNULAR SOLAR ARRAY
3817481 - OEPLOYABLE SOLAR ARRAY FOR A SPIN STABILIZEO SPACECRAFT
3833426 - SOLAR ARRAY
3837924 - SOLAR ARRAY
3925103 - RAOIATION HARD SOLAR CELL ANO ARRAY

UCE, INC.
4106951 - PHOTOVOLTAIC SEMICONOUCTOR OEVICE USING AN ORGANIC MATERIAL AS AN ACTIVE LAYER

UNION CARBIOE CORPORATION
4124410 - SILICON SOLAR CELLS WITH LOW-COST SUBSTRATES

UNITEO KINGDOM OF GREAT BRITAIN ANO NORTHERN IRELANO,
3627585 - SOLAR CELL ARRAYS

UNITED STATES GOVERNMENT AS REPRESENTEO BY THE UNITEO STATES
4105470 - OYE-SENSITIZED SCHOTTKY BARRIER SOLAR CELLS

UNITEO STATES OF AMERICA, AIR FORCE
3438120 - METHOO OF MAKING SOLAR CELL
3530007 - SOLAR CELL INCLUOING ACEANTHRAQUINOXALINE PHOTOSENSITIVE MATERIAL
3620847 - SILICON SOLAR CELL ARRAY HAROENEO TO SPACE NUCLEAR BLAST RAOIATION
3690953 - VERTICAL JUNCTION HAROENEO SOLAR CELL
3873215 - RAOIOMETER
3879228 - PHOTO-REGENERATIVE ELECTROCHEMICAL ENERGY CONVERTER
3985579 - RIB AND CHANNEL VERTICAL MULTIJUNCTION SOLAR CELL

UNITEO STATES OF AMERICA, ARMY
3751303 - ENERGY CONVERSION SYSTEM
3929510 - SOLAR RAOIATION CONVERSION SYSTEM
4000505 - THIN OXIOE MOS SOLAR CELLS
4051465 - FERROELECTRIC CERAMIC OEVICES
4116717 - ION IMPLANTEO EUTECTIC GALLIUM ARSENIOE SOLAR CELL

UNITEO STATES OF AMERICA, OEPARTMENT OF ENERGY
3986490 - REOUCING HEAT LOSS FROM THE ENERGY ABSORBER OF A SOLAR COLLECTOR
3991740 - SEA SHELL SOLAR COLLECTOR
4002499 - RADIANT ENERGY COLLECTOR
4029519 - SOLAR COLLECTOR HAVING A SOLID TRANSMISSION MEOIUM
4118249 - MODULAR ASSEMBLY OF A PHOTOVOLTAIC SOLAR ENERGY RECEIVER
4129463 - POLYCRYSTALLINE SILICON SEMICONOUCTING MATERIAL BY NUCLEAR TRANSMUTATION DOPING

UNITEO STATES OF AMERICA, NATIONAL AERONAUTICS ANO SPACE ADM
3426263 - METHOO ANO APPARATUS FOR BATTERY CHARGE CONTROL
3434885 - METHOO OF MAKING ELECTRICAL CONTACT ON SILICON SOLAR CELL AND RESULTANT PROOUCT
3437527 - METHOO FOR PROOUCING A SOLAR CELL HAVING AN INTEGRAL PROTECTIVE COVERING
3446676 - SOLAR BATTERY WITH INTERCONNECTING MEANS FOR PLURAL CELLS
3459391 - INTERCONNECTION OF SOLAR CELLS
3466198 - SOLAR CELL MATRIX
3472698 - SILICON SOLAR CELL WITH COVER GLASS BONOED TO CELL BY METAL PATTERN
3473758 - ROLL-UP SOLAR ARRAY

ASSIGNEO PATENTING(1/69 - 12/78) - - ALPHA LISTING

UNITED STATES OF AMERICA, NATIONAL AERONAUTICS ANO SPACE AOM (CONTINUEO)

3490965 - RADIATION RESISTANT SILICON SEMICONOUCTOR OEVICES
3493437 - SOLAR CELL SUBMOOULE
3520496 - SERPENTUATOR
3532551 - SOLAR CELL INCLUOING SECONO SURFACE MIRRORS
3541422 - COULOMETER ANO THIRO ELECTRODE BATTERY CHARGING CIRCUIT
3541679 - METHOO OF ATTACHING A COVER GLASS TO A SILICON SOLAR CELL
3565719 - SOLAR PANEL FABRICATION
3591420 - SOLAR CELL
3594803 - INTEGRATEO THERMOELECTRIC GENERATOR/SPACE ANTENNA COMBINATION
3597281 - RECOVERY OF RADIATION OAMAGEO SOLAR CELLS THROUGH THERMAL ANNEALING
3615853 - SOLAR CELL PANELS WITH LIGHT TRANSMITTING PLATE
3616528 - SOLID STATE MATRICES
3620846 - OEPLOYABLE SOLAR CELL ARRAY
3630627 - SOLAR CELL ASSEMBLY TEST METHOO
3636539 - OPTIMUM PERFORMANCE SPACECRAFT SOLAR CELL SYSTEM
3653970 - METHOD OF COATING SOLOR CELL WITH BOROSILICATE GLASS ANO RESULTANT PRODUCT
3664874 - TUNGSTEN CONTACTS ON SILICON SUBSTRATES
3672999 - USE OF UNILLUMINATEO SOLAR CELLS AS SHUNT OIOOES FOR A SOLAR ARRAY
3715600 - STACKEO SOLAR CELL ARRAYS
3760257 - ELECTROMAGNETIC WAVE ENERGY CONVERTER
3780424 - METHOD OF MAKING SILICON SOLAR CELL ARRAY
3903699 - SOLAR ENERGY POWER SYSTEM
3912540 - COVERED SILICON SOLAR CELLS AND METHOD OF MANUFACTURE
3920413 - PANEL FOR SELECTIVELY ABSORBING SOLAR THERMAL ENERGY ANO THE METHOO OF PRODUCING SAIO PANEL
3961997 - FABRICATION OF POLYCRYSTALLINE SOLAR CELLS ON LOW-COST SUBSTRATES
3966499 - SOLAR CELL GRIO PATTERNS
3989541 - SOLAR CELL ASSEMBLY
3996067 - SILICON NITRIOE COATEO, PLASTIC COVEREO SOLAR CELL
4077818 - PROCESS FOR UTILIZING LOW-COST GRAPHITE SUBSTRATES FOR POLYCRYSTALLINE SOLAR CELLS
4082569 - SOLAR CELL COLLECTOR
4083097 - METHOO OF MAKING ENCAPSULATEO SOLAR CELL MODULES
4084985 - METHOO FOR PROOUCING SOLAR ENERGY PANELS BY AUTOMATION
4089705 - HEXAGON SOLAR POWER PANEL
4122214 - SOLAR CELL COLLECTOR ANO METHOO FOR PROOUCING SAME
4131486 - BACK WALL SOLAR CELL

UNITED STATES OF AMERICA, NAVY

3421067 - BATTERY CHARGE CONTROLLER UTILIZING COULOMETER
3435328 - ELECTRONIC SOLAR CELL ARRAY SIMULATOR
3635425 - OEPLOYMENT METHOO FOR A TELESCOPING SOLAR ARRAY
3740636 - CHARGE REGULATOR ANO MONITOR FOR SPACECRAFT SOLAR CELL/BATTERY SYSTEM CONTROL
3769091 - SHINGLED ARRAY OF SOLAR CELLS
3811181 - APPROACH TO SHINGLING OF SOLAR CELLS
3833425 - SOLAR CELL ARRAY
3885058 - METHOO OF MANUFACTURING CAOMIUM SULPHIOE PHOTOCELLS
3964155 - METHOO OF PLANAR MOUNTING OF SILICON SOLAR CELLS
3986021 - PASSIVE SOLAR TRACKING SYSTEM FOR STEERABLE FRESNEL ELEMENTS
4070205 - ALUMINUM ARSENIOE EUTECTIC GALLIUM ARSENIOE SOLAR CELL

UNITED TECHNOLOGIES CORPORATION

4021267 - HIGH EFFICIENCY CONVERTER OF SOLAR ENERGY TO ELECTRICITY

ASSIGNEO PATENTING(1/69 - 12/78) - - ALPHA LISTING

UNIVERSITY OF MINNESOTA, THE REGENTS OF
3994012 - PHOTOVOLTAIC SEMI-CONOUCTOR OEVICES

UNIVERSITY OF SOUTHERN CALIFORNIA
4099199 - PHOTOVOLTAIC CELL EMPLOYING A PBO-SNO HETEROJUNCTION

U.S. PHILIPS CORPORATION
3480818 - ELECTRICAL MONOGRAIN LAYERS HAVING A RAOIATION PERMEABLE ELECTROOE
3521350 - METHOO OF MANUFACTURING SEMICONOUCTOR DEVICES
3553030 - RAOIATION-SENSITIVE SEMICONOUCTOR DEVICE
3595716 - METHOOS OF MANUFACTURING SEMICONOUCTOR OEVICES
3615854 - ELECTRODE SYSTEM EMPLOYING OPTICALLY ACTIVE GRAINS
3764325 - METHOO FOR MAKING ELECTRICAL MONOGRAIN LAYER
3802920 - SUPPORT FOR A BATTERY OR PHOTOELECTRIC SOLAR CELLS
3847758 - METHOO OF MANUFACTURING AN ELECTROOE SYSTEM
4100427 - OEVICE FOR CONVERTING SOLAR ENERGY

VARIAN ASSOCIATES, INC.
3993506 - PHOTOVOLTAIC CELL EMPLOYING LATTICE MATCHEO QUATERNARY PASSIVATING LAYER
4002031 - SOLAR ENERGY CONVERTER WITH WASTE HEAT ENGINE
4017332 - SOLAR CELLS EMPLOYING STACKED OPPOSITE CONOUCTIVITY LAYERS
4126930 - MAGNESIUM OOPING OF ALGAAS

WACKER-CHEMITRONIC GESELLSCHAFT FUR ELEKTRONIK GRUNOSTOFFE M
4113532 - PROCESS FOR PROOUCING LARGE-SIZE SUBSTRATE-BASEO SEMICONOUCTOR MATERIAL UTILIZING VAPOR-PHASE OEPOSITION ANO SUBSEQUENT RESOLIOIFICATION

WESTINGHOUSE ELECTRIC CORP.
3421943 - SOLAR CELL PANEL HAVING CELL EOGE ANO BASE METAL ELECTRICAL CONNECTIONS
3421946 - UNCOMPENSATEO SOLAR CELL
3457427 - LIGHTWEIGHT SOLAR CELL PANEL STRUCTURE
3457467 - HETEROJUNCTION SOLAR CELL WITH SHORTEO SUBSTRATE
3460240 - MANUFACTURE OF SEMICONOUCTOR SOLAR CELLS
3480781 - TEMPERATURE COMPENSATEO SOLAR CELL LIGHT SENSOR
3533850 - ANTIREFLECTIVE COATINGS FOR SOLAR CELLS
3588000 - ORBIT POSITION CONTROL OF PLANAR REFLECTOR SATELLITES
3589946 - SOLAR CELL WITH ELECTRICAL CONTACT GRIO ARRANGEMENT
3682708 - SOLAR CELL
3758348 - METHOO FOR PREPARING SOLAR CELLS
3975211 - SOLAR CELLS AND METHOO FOR MAKING SAME
4042418 - PHOTOVOLTAIC OEVICE ANO METHOO OF MAKING SAME

WHITE, LETCHER T.
4023088 - RAOIATION-TO-A.C. CONVERTER

XEROX CORPORATION
3513040 - RAOIATION RESISTANT SOLAR CELL

YEOA RESEARCH ANO OEVELOPMENT CO., LTO.
4064326 - PHOTO-ELECTROCHEMICAL CELL CONTAINING CHALCOGENIOE REDOX COUPLE ANO HAVING STORAGE CAPABILITY

UNASSIGNEO PATENTS (1/75-12-78) INVENTORS (ALPHA LISTING)

INVENTOR NAME				STREET	CITY	ST	ZIP/CNTRY
ANOERSON	JOHN	HARLAND		12920 NICOLLET AVE.	BURNSVILLE	MN	55337
4037029 - PHOTOELECTROGENERATIVE CELL							
APPEL	WALTER	O.		4350 COMMERCE ROAO	ORCHARO LAKE	MI	48033
4028770 - WINOSHIELO WIPER ASSEMBLY							
ARMITAGE	WILLIAM	F.	JR.	5 BARON PARK LANE, APT. 37	BURLINGTON	MA	01803
3978333 - PHOTOVOLTAIC DEVICE HAVING POLYCRYSTALLINE BASE							
BECK	TIMOTHY	A.		723 EIGHTH PL.	HERMOSA BEACH	CA	90254
4117202 - SOLAR POWEREO BIOLOGICAL FUEL CELL							
BONO	JOHN	W.	JR.	6621 WAKEFIELO DRIVE, APT. 306	ALEXANDRIA	VA	22307
4063963 - TERRESTRIAL PHOTOVOLTAIC SOLAR CELL PANEL							
BUTLER	OAVIO	M.		46 FARRAGUT ROAO	ANNAPOLIS	MO	21403
4075034 - SOLAR CONVERTER							
CAMPBELL	WILLIAM	PATRICK	III	3310 ROWLANO PL.	WASHINGTON	OC	20008
4081289 - SOLAR ENERGY SYSTEM							
COLEMAN	RICH	F.		117 "P" ST.	SALT LAKE CITY	UT	84103
4026267 - SOLAR ENERGY APPARATUS							
CREMONESE	OTTO	A.		3010 PERRY AVE.	TAMPA	FL	32304
3977909 - SOLAR HEAT ENERGY CONVERSION SYSTEM							
CRISMAN	EVERETT			8 EAST ST.	PROVIOENCE	RI	02907
3978333 - PHOTOVOLTAIC OEVICE HAVING POLYCRYSTALLINE BASE							
DOLAMORE	PETER	WILLIAM		P.O. BOX 10142	JOHANNESBURG		ZA
4050444 - REFLECTIVE OEVICE							
ELIASON	JON	T.			HUNTSVILLE	AL	
3984256 - PHOTOVOLTAIC CELL ARRAY							
FANG	PAO-HSIEN			156 COMMON ST.	BELMONT	MA	02178
3914856 - ECONOMICAL SOLAR CELL FOR PROOUCING ELECTRICITY							
FLETCHER	JAMES	C.			HUNTSVILLE	AL	
3984256 - PHOTOVOLTAIC CELL ARRAY							
FLETCHER	JAMES	C.			LA CANAOA	CA	
4053918 - HIGH VOLTAGE, HIGH CURRENT SCHOTTKY BARRIER SOLAR CELL							
GIBBONS	JAMES	F.		320 TENNYSON AVE.	PALO ALTO	CA	94301
4001864 - SEMICONOUCTOR P-N JUNCTION SOLAR CELL ANO METHOO OF MANUFACTURE							
GRAVISSE	PHILIPPE	EOOUARD		9, RESIDENCE BOIELDIEU	92800-PUTEAUX		FR
3912931 - PHOTOVOLTAIC DEVICE WITH LUMINESCENT LAYERS OF OIFFERING COMPOSITION							
GRAZIER	JAMES	A.		P.O. BOX 382	BERLIN	MD	21811
4122396 - STABLE SOLAR POWER SOURCE FOR PORTABLE ELECTRICAL OEVICES							

UNASSIGNEO PATENTS (1/75-12-78) INVENTORS (ALPHA LISTING)

INVENTOR NAME			STREET	CITY	ST	ZIP/CNTRY
GRIFFITHS	KENNETH	F.	31 LONOON TER.	NEW ROCHELLE	NY	10804
4095997 - COMBINEO SOLAR CELL AND HOT AIR COLLECTOR APPARATUS						
GULKO	ARNOLO	G.	2001 JEFF. DAVIS, #609	ARLINGTON	VA	22202
4101923 - SOLAR CELLS						
HAMILTON	GEORGE	HENRY	1425 FOURTH ST., SW.	WASHINGTON	OC	20024
4025786 - SOLAR ENERGY POWER GENERATING ARRAY						
HAROY	CRAIG	A.	CIRCLE OR.	HART	MI	49420
4101925 - CENTRIFUGAL FORMING THIN FILMS ANO SEMICONOUCTORS ANO SEMICONOUCTOR OEVICES						
HOLT	F.	SHEPPARO	46 EMERSON ROAD	WINCHESTER	MA	01890
4058110 - WIOE ANGLE SOLAR HEAT COLLECTION SYSTEM						
JAHN	ARNOLO		1124 N. ELM ST.	FAIRMONT	MN	56031
3998206 - SYSTEM FOR COLLECTING ANO UTILIZING SOLAR ENERGY						
KELLEY	LARRY	P.	1024 STATE ST.	HART	MI	49420
4101925 - CENTRIFUGAL FORMING THIN FILMS ANO SEMICONOUCTORS ANO SEMICONDUCTOR DEVICES						
KELLY	OONALO	A.	58 - 06 69TH PLACE	MASPETH	NY	11378
4023368 - HIGH OENSITY-THIRO OIMENSION GEOMETRY SOLAR PANELS						
KELLY	DONALD	A.	58-06 69TH PL.	MASPETH, NEW YORK	NY	11378
4119863 - COMBINED HIGH DENSITY SOLAR PANELS ANO VERTICAL WINO TURBINES						
KING	WILLIAM	J.	9 PUTNAM RO.	READING	MA	01867
4086102 - INEXPENSIVE SOLAR CELL AND METHOD THEREFOR						
KRAVITZ	JEROME	H.	12403 BRAXFIELD CT.	ROCKVILLE	MD	20952
4106952 - SOLAR PANEL UNIT						
L'ESPERANCE	PAUL	M.	BOX 482, OAKWOOO LANE	VALLEY FORGE	PA	19481
4024852 - SOLAR ENERGY REFLECTOR-COLLECTOR						
LINDMAYER	JOSEPH		6919 BLAISDELL RO.	BETHESDA	MO	20034
4093473 - SOLAR PANEL WITH UV ABSORBER						
4097310 - METHOD OF FORMING SILICON SOLAR ENERGY CELLS						
LINOMAYER	JOSEPH		1335 PICCARD OR.	ROCKVILLE	MO	20850
4082568 - SOLAR CELL WITH MULTIPLE-METAL CONTACTS						
4106047 - SOLAR CELL WITH OISCONTINUOUS JUNCTION						
MANELAS	ARTHUR	J.	38 MEAOOW DR.	LOWELL	MA	01854
4080221 - SOLAR CELL ELECTRIC AND HEATING SYSTEM						
MILNES	ARTHUR	G.	1417 INVERNESS AVE.	PITTSBURGH	PA	15217
4094704 - DUAL ELECTRICALLY INSULATEO SOLAR CELLS						
O'HARE	LOUIS		1041 PONDEROSA, APT. 2	FORT COLLINS	CO	80521
4087735 - SOLAR ELECTRIC GENERATION USING VARIABLE CAPACITORS						

UNASSIGNEO PATENTS (1/75-12-78) INVENTORS (ALPHA LISTING)

INVENTOR NAME			STREET	CITY	ST	ZIP/CNTRY
O'HARE	LOUIS	R.	1041 PONOEROSA APT. 2	FORT COLLINS	CO	80521
4074129 - ELECTRIC GENERATION BY LIGHT-VARIABLE CAPACITANCE						
O'HARE	LOUIS	RICHARD	1818 MARLBOROUGH COURT	FORT COLLINS	CO	80521
3971938 - METHOO OF GENERATING ELECTRICITY FROM RAOIANT ENERGY CALLEO VARIABLE POLARIZABILITY CAPACITY GENERATOR						
PAVLAK	ALEX		JUG HOLLOW ROAO	PHOENIXVILLE	PA	19460
4024852 - SOLAR ENERGY REFLECTOR-COLLECTOR						
PREVOT	MICHEL		20, RUE CHARTRAN	92300-NEUILLY		FR
3912931 - PHOTOVOLTAIC OEVICE WITH LUMINESCENT LAYERS OF OIFFERING COMPOSITION						
SHER	ARDEN		108 CHARLES RIVER LANOING RO.	WILLIAMSBURG	VA	23185
4084101 - APPARATUS FOR CONVERTING RAOIANT ENERGY TO ELECTRIC ENERGY						
4096393 - SOLAR ENERGY CONVERTER						
STEINBERG	JACOB	H.	2001 JEFF. OAVIS, #609	ARLINGTON	VA	22202
4101923 - SOLAR CELLS						
STIRN	RICHARO	J.		LA CANAOA	CA	
4053918 - HIGH VOLTAGE, HIGH CURRENT SCHOTTKY BARRIER SOLAR CELL						
TCHERNEV	OIMITER	I.	3905 SIERRA ORIVE	AUSTIN	TX	78731
3925212 - OEVICE FOR SOLAR ENERGY CONVERSION BY PHOTO-ELECTROLYTIC OECOMPOSITION OF WATER						
WILKERSON	ALAN	W.	410 MAOERO DRIVE	THIENSVILLE	WI	53092
3946242 - GEOPHYSICAL ENERGY SOURCE UTILIZATION CIRCUIT						
YATER	JOSEPH	C.	AUTUMN LANE	LINCOLN	MA	01773
4004210 - REVERSIBLE THERMOELECTRIC CONVERTER WITH POWER CONVERSION OF ENERGY FLUCTUATIONS						

PATENTS (1/63-12/78) WITH NEITHER ASSIGNMENT NOR INVENTOR INFORMATION IN DATABASE

3427797 - TIMEPIECE USING A SOLAR BATTERY AS THE POWER SOURCE
3436275 - METHOD OF TREATING SOLAR CELLS
3460992 - COLLAPSIBLE SOLAR PHOTOELECTRIC BATTERY
3462310 - APPARATUS FOR THE CONVERSION OF SOLAR ENERGY TO ELECTRICAL ENERGY
3467840 - SOLAR THERMIONIC CONVERTOR
3630015 - LIGHT TRANSFORMATION OEVICE
3844840 - SOLAR ENERGY HELMET

3076861	3078328	3081370	3082283	3088989	3089043	3089070	3091555	3094439	3104188	3112230	3113047
3114658	3116035	3116171	3121648	3127552	3130084	3134906	3145948	3147414	3148846	3149246	3150999
3151379	3152260	3152774	3152926	3162764	3165751	3169725	3173626	3173801	3175105	3175929	3177367
3179861	3184187	3186674	3186873	3186874	3188020	3188472	3198969	3218196	3222535	3225208	3225268
3226062	3229930	3231426	3232795	3239165	3245636	3247427	3251995	3252023	3255044	3255047	3258224
3258598	3261074	3263101	3264707	3268366	3268732	3271198	3272986	3274403	3278337	3278769	3284241
3290175	3293082	3296469	3304028	3310439	3310967	3311322	3311510	3313939	3317809	3322575	3326497
3330700	3331707	3339863	3340096	3340599	3346419	3348374	3350234	3350618	3350775	3351035	3353191
3354313	3358944	3359137	3361594	3364631	3365652	3368125	3369939	3370986	3373051	3373321	3375136
3375141	3376163	3376164	3376165	3378407	3379394	3382099	3383246	3383584	3384806	3387199	3390020
3396057	3401062	3402322	3403427	3405271	3405272	3405273	3411050	3411952	3412955	3414213	3416956
3418170	3419433	3419434	3419779	4117506	0	0	0	0	0	0	0

DIRECT CONVERSION OF SOLAR ENERGY TO ELECTRICAL ENERGY

PATENTING UPDATE (1/79-10/79)

Patent No.	Assignee & Title
4,131,984	Massachusetts Institute of Technology: Method Of Making A High-Intensity Solid-State Cell
4,132,223	E. Garland Reddell, 115 E. 26th St., Yuma, AZ 85364: Tracking System For Solar Energy Collector
4,132,570	Exxon Research & Engineering Company: Structural Support For Solar Cell Array
4,133,501	Communications Satellite Corp.: Self-Deployable Solar Cell Panel
4,133,502	RCA Corporation: Plural Panels Deployed Effectively As A Single Panel
4,133,697	Robert A. Frosch, Adm. of the National Aeronautics & Space Adm. with respect to an invention of Robert L. Mueller, Azusa, and Robert K. Yasui, Monterey Park, both of CA: Solar Array Strip And A Method For Forming The Same
4,133,698	Texas Instruments Incorporated: Tandem Junction Solar Cell
4,133,699	Communications Satellite Corporation: Shaped Edge Solar Cell Coverslide
4,134,387	Mobil Tyco Solar Energy Corporation: Solar Energy Concentrator
4,134,392	Spectrum Conversion Inc.: Solar Energy Collection
4,134,393	Virgil Stark: Solar Energy Collection
4,135,290	The U.S. of America as rep. by the Adm. of the Nat'n Aeronautics & Space Adm., Washington, D.C.: Method For Fabricating Solar Cells Having Integrated Collector Grid
4,135,950	Communications Satellite Corporation: Radiation Hardened Solar Cell
4,136,309	Robert L. Galberth, 12452 Gilbert, Garden Grove, CA 92641; Roy L. Arnold, 16262 Wishingwell Lane, Huntington Beach, CA 92647; & John C. Bollinger, 9181 Heatherton, Cir., Huntington Beach, CA 92646: Power Output Control Circuit For Solar-Powered Cathodic Protection System

4,136,436 Texas Instruments Incorporated: Light Energy Conversion

4,137,095 Solarex Corporation: Constant Voltage Solar Cell And Method Of Making Same

4,137,096 Henry B. Maier, 6 Sealy Ave., Hempstead, L.I., NY 11550: Low Cost System For Developing Solar Cells

4,137,097 Joseph E. Kelly, 508 Island St., La Crosse, WI 54001: Solar Energy Assembly

4,137,098 The U.S. of America as represented by Secretary of the Navy, Washington, D.C.: Solar Energy Window

4,137,902 Jesse C. Bunch, 816 Easley St., Silver Spring, MD 20910: Energy Concentrator System

4,138,532 Optel Corporation: N-Methylphenazine Photogalvanic Cell

4,139,399 Solarex Corporation: Solar Panel With Removable Cell Matrix, And Method Of Making Same

4,139,858 RCA Corporation: Solar Cell With A Gallium Nitride Electrode

4,140,142 Anatoly A. Dormidontov, ulitsa Marii Ulyanovoi, 11 kv 93, Moscow, USSR (& 8 other inventors): Semiconductor Photoelectric Generator

4,140,544 Atlantic Richfield Company: Divergent Luminescent Collector For Photovoltaic Device

4,140,545 Sharp Kabushiki Kaisha: Plural Solar Cell Arrangement Including Transparent Interconnectors

4,140,591 Purdue Research Foundation: Photoelectrolytic Apparatus For Water Splitting

4,140,610 Futaba Denshi Kogyo Kabushiki Kaisha: Method Of Producing A PN Junction Type Solar Battery

4,141,811 Atlantic Richfield Company: Plasma Etching Process For The Manufacture Of Solar Cells

4,143,233 Monsanto Research Corp.: Solar Energy Collector

4,143,234 Monsanto Company: Solar Collector Using Total Internal Reflectance

4,143,235 Chevron Research Company: Cadmium Sulfide Photovoltaic Cell And Method Of Fabrication

4,144,094 Motorola, Inc: Radiation Responsive Current Generating Cell And Method Of Forming

4,144,095 Mobil Tyco Solar Energy Corp.: Solar Energy Assembly

4,144,096 Kabushiki Kaisha Suwa Seikosha: Solar Battery And Method Of Manufacture

4,144,097 Atlantic Richfield Company: Luminescent Solar Collector

4,144,139 Solarex Corp.: Method Of Plating By Means Of Light

4,144,147 E.I. Du Pont de Nemours & Co.: Photolysis Of Water Using Rhodate Semiconductive Electrodes

4,146,407 Tatyana A. Litsanko, ultisa Trubnaya 11, kv. 12; Valery N. Potapov, ultisa Timiryazevskaya, 13,kv. 213 and Dmitry S. Strebov, Luganskaya ultisa, 21, all of Moscow, USSR: Solar Photoelectric Module

4,146,408 Richard B. Nelson, Los Altos Hills, CA: Aspherical Solar Cell Concentrator

4,146,790 Fraunhofer - Gesellschaft zur Forderung der Angewandeten Forschung e.V.: Apparatus For Converting Light Energy Into Heat Energy By Light Concentration By Means Of Fluorescent Layers

4,147,157 Ramig H. Zakhariya, 2400 McBride La., No. 50, Santa Rosa, CA 95401: Self-Supporting Active Solar Energy System

4,147,560 Licentia Patent-Verwaltungs GmbH: Solar Cell Arrangment For Terrestrial Use

4,147,561 John R. Knight, 10 Milton Rd., Gayton, Northampton, England: Solar Energy Collector

4,147,563 United States of America, Department of Energy: Method For Forming P-N Junctions And Solar-Cells By Laser Beam Processing

4,148,052 Westinghouse Electric Corp.: Radiant Energy Sensor

4,148,298 Benjamin F. Sherman, Jr., 6329 Mori So., McLean, VA 22101: Hemispherical Collector Of Direct Dispersed And Reflected Waves

4,148,299 Benjamin F. Sherman, Jr. 6329 Mori St., McLean, VA 22101: Hemitoroidal Collector Of Direct Dispersed And Reflected Waves

4,149,025 Vasile Niculescu, 35B Ridgeview Heights, West Wellington, CN: Method Of Fabricating Thermoelectric Power Generator Modules

4,149,665 Robert A. Frosch, Adm. of the National Aeronautics & Space Adm. with respect to an invention of; Ernest N. Costogue, Tujunga; Roy G. Downing, Torance; Orwin Middleton, Reseda; Robert L. Mueller, Azusa;Robert K. Yasui, Monterey Park; Fred J. Cairo, L.A. & Jerry K. Person, L.A. all of CA: Bonding Machine For Forming A Solar Array Strip

4,149,902 Eastman Kodak Company: Fluorscent Solar Energy Concentrator

4,149,903 Solarex Corporation: Hybrid Solar Energy Collecting Device

4,151,005 Dmitry S. Strebkov, Kirovogradsky proezd, 3 korpus 1, Moscow, U.S.S.R., (and 5 others): Radiation Hardened Semiconductor Photovoltaic Generator

4,152,174 Ogden R. Ludlow, 137 Third St., P.O. Box 206, Renovo, PA 17764: Photoelectric Cell Using An Improved Photoelectric Plate And Plate Array

4,152,175 The U.S. of America as represented by U.S. Dept. of Energy: Silicon Solar Cell Assembly

4,152,490 Optel Corporation: Radiant Energy Converter Having Storage

4,152,535 The Boeing Company: Continuous Process For Fabricating Solar Cells And The Product Produced Thereby

4,152,536 Mobil Tyco Solar Energy Corporation: Solar Cells

4,152,597 Ronald V. Hansch, 203 NE 113, Portland, OR 97220: Electricity Generator

4,152,824 Mobil Tyco Solar Energy Corporation: Manufacture Of Solar Cells

4,153,474 Erno Raumfahrttechnik GmbH: Solar Energy Collector

4,153,475 Ross B. Hider, 2752 29th St., & Ross J. Hider, 4062 Cherokee St., both of San Diego, CA 92104: Three Dimensional Solar Panel Assembly

4,153,476 Robert A. Frosch, Adm. of the National Aeronautics & Space Adm. with respect to an invention of, and Benjamin Shelpuk, Evergreen, CO: Double-Sided Solar Cell Package

4,153,813 Atlantic Richfield Company: Luminescent Solar Collector

4,154,998 TRW Inc.: Solar Array Fabrication Method And Apparatus Utilizing Induction Heating

4,155,371 Atlantic Richfield Company: Luminescent Solar Collector

4,155,524 Societe Nationale Industrielle Aerospatiale, France: Device For The Synchronized Unfolding Of Articulated Elements Carrying Solar Cells In A Panel Formed By A Series Of Articulated Elements

4,155,781 Siemens Aktiengsellschaft: Method Of Manufacturing Solar Cells Utilizing Single-Crystal Whisker Growth

4,155,785 International Business Machines Corporation: Process Of Making A Radiation Responsive Device

4,156,309 The U.S. of America as represented by Adm. of the National Aeronautics & Space Adm.: Method Of Construction Of A Multi-Cell Solar Array

4,156,310 Hughes Aircraft Company: High Bandgap Window Layer For GaAs Solar Cells And Fabrication Process Therefor

4,156,622 Solarex Corporation: Tantalum Oxide Antireflective Coating And Method Of Forming Same

4,158,577 Arthur G. Milnes, c/o Carnegie-Mellon Univ., Schenley Park, Pittsburgh, PA 15213: High Output Solar Cells

4,158,591 Atlantic Richfield Company: Solar Cell Manufacture

4,159,212 Atlantic Richfield Company: Luminescent Solar Collector

4,159,354 Arthur G. Milnes, 1417 Inverness Ave., Pittsburgh, PA 15217 & Donald L. Feucht, 193 Penhurst Dr., Pittsburgh, PA 15235: Method For Making Thin Film III-V Compound Semiconductors For Solar Cells Involving The Use Of A Molten Intermediate Layer

4,159,710 U.S. Philips Corporation: Solar Collector Comprising Solar Tracking Means

4,159,914 Photon Power, Inc.: Photovoltaic Cell

4,160,816 RCA Corporation: Process For Storing Solar Energy In The Form Of An Electrochemically Generated Compound

4,161,657 Marlin R. Shaffer, 1957 Hubbard Ave., Salt Lake City, Utah 84108: Hydrogen Supply And Utility Systems And Components Thereof

4,162,174 Massachusetts Institute of Technology: Solar Cell Array

4,162,177 Solarex Corporation: Method Of Forming Solar Cell With Discontinuous Junction

4,162,505 RCA Corporation: Inverted Amorphous Silicon Solar Cell Utilizing Cermet Layers

4,162,928 Robert A. Frosch, Adm. of the National Aeronautics & Space Adm.: Solar Cell Module

4,163,194 California Institute of Technology: Voltage-Current-Power Meter For Photovoltaic Solar Arrays

4,163,678 Robert A. Frosch, Adm. of the National Aeronautics & Space Adm. with respect to and invention of, and Kenneth R. Bube, Skillman, NJ: Solar Cell With Improved N-Region Contact And Method Of Forming The Same

4,163,987 Hughes Aircraft Co.: GAAS-GAALAS Solar Cells

4,164,123 Otto J.M. Smith, 612 Euclid Ave., Berkeley, CA 94708: Solar Thermal Electric Power Plant

4,164,145 De Laval Turbine Inc.: Self-Powered Electrical Meter For Display Of A Liquid-Level Or The Like Measurement

4,164,431 Eastman Kodak Company: Multilayer Organic Photovoltaic Elements

4,164,432 Owens-Illinois, Inc.: Luminescent Solar Collector Structure

4,164,698 Truimph Werke Nurnberg, AG: Battery Charging Circuit

4,164,934 Robert V. Anderson, 3900 Sumercrest Dr., Ft. Worth, TX 76109: Elliptical Solar Reflector

4,165,241 Atlantic Richfield Company: Solar Cell With Improved Printed Contact And Method Of Making The Same

4,165,604 Citizen Watch Co., Ltd.: Solar Battery Timepiece

4,166,880 Solamat Inc.: Solar Energy Device

4,166,917 Corning Glass Works: Concentrating Solar Receiver

4,166,918 RCA Corporation: Method Of Removing The Effects Of Electrical Shorts And Shunts Created During The Fabrication Process Of A Solar Cell

4,166,919 RCA Corporation: Amorphous Silicon Solar Cell Allowing Infrared Transmission

4,167,015 RCA Corporation: Cermet Layer For Amorphous Silicon Solar Cells

4,167,461 Allied Chemical Corporation: Photoenhanced Reduction Process

4,167,644 Exxon Research & Engineering Co.: Solar Cell Module

4,167,746 General Electric Company: Radiation Triggered Thyristor With Light Focussing Guide

4,168,716 Herbert Fowler, P.O. Box 11431, Lexington, KY 40511, Allan Israel, P.O. Box 5627 Lexington, KY 40505: Solar-Powered Thermionic-Photoelectric Laser

4,169,738 Antonio Lugue, Leneros 29, 1º B, Madrid 20, Spain: Double-Sided Solar Cell With Self-Refrigerating Concentrator

4,170,507 Motorola, Inc.: Method For Encapsulating A Solar Cell Array

4,171,003 Commissariat a l'Energie Atomique: Solar Energy To Electrical Energy Converter

4,171,617 Agency of Industrial Science and Technology: Solar Thermal Electric Systems

4,171,989 Motorola, Inc.: Contact For Solar Cells

4,171,997 Brown, Boveri, & Cie, AG: Method Of Producing Polycrystalline Silicon Components, Particularly Solar Elements

4,172,739 Solar Homes, Inc.: Sun Tracker With Dual Axis Support For Diurnal Movement And Seasonal Adjustment

4,172,740 William P. Campbell, III, 3310 Rowland Pl., NW, Washington, D.C. 20008: Solar Energy System

4,172,925 Refac Electronic Corp. & Grumman Aerospace Corporation, (pt. interest to each): Photoelectrochemical Cell

DIRECT CONVERSION OF SOLAR ENERGY TO MECHANICAL ENERGY

This profile includes systems which utilize thermal energy radiated by the sun to perform useful mechanical work directly. In general, these systems include a thermally expansible or vaporizable working fluid which is heated by solar radiation. The pressurized fluid thus produced is used to drive a fluid motor.

INCLUDED IN THIS PROFILE ARE SELECTED PATENTS FROM:

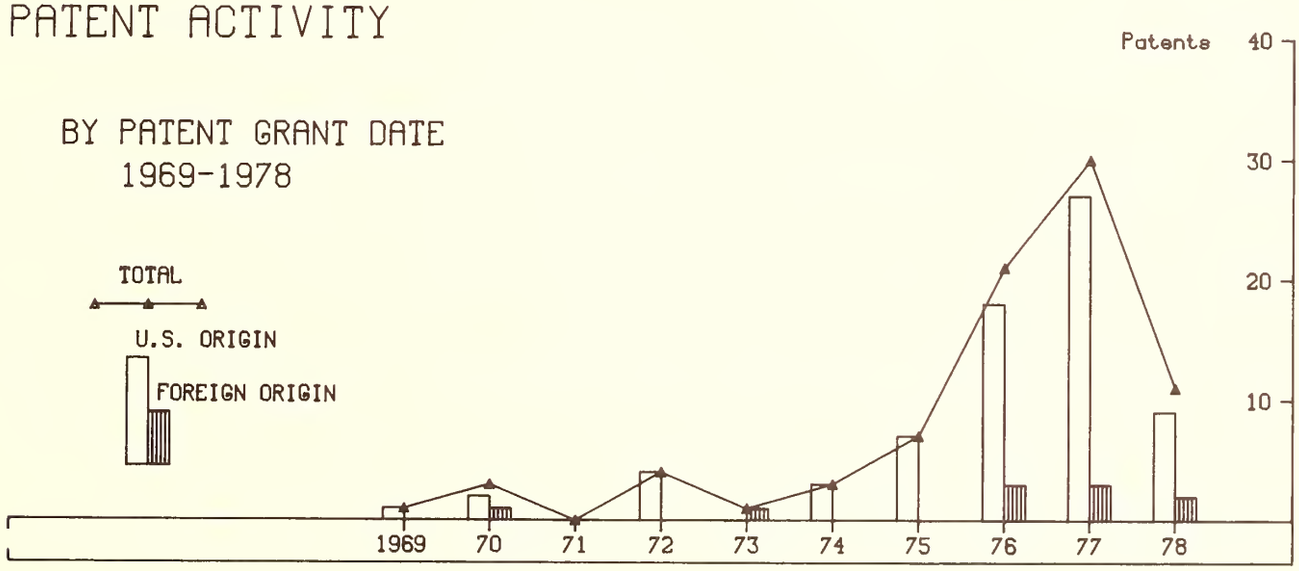
Class 60, Subclasses 398,641
Class 244, Subclasses 168,173
Class 416, Subclasses 37,41,85
Class 417, Subclasses 52,53,334,379

ACTIVITY INDICES (1976-1978)

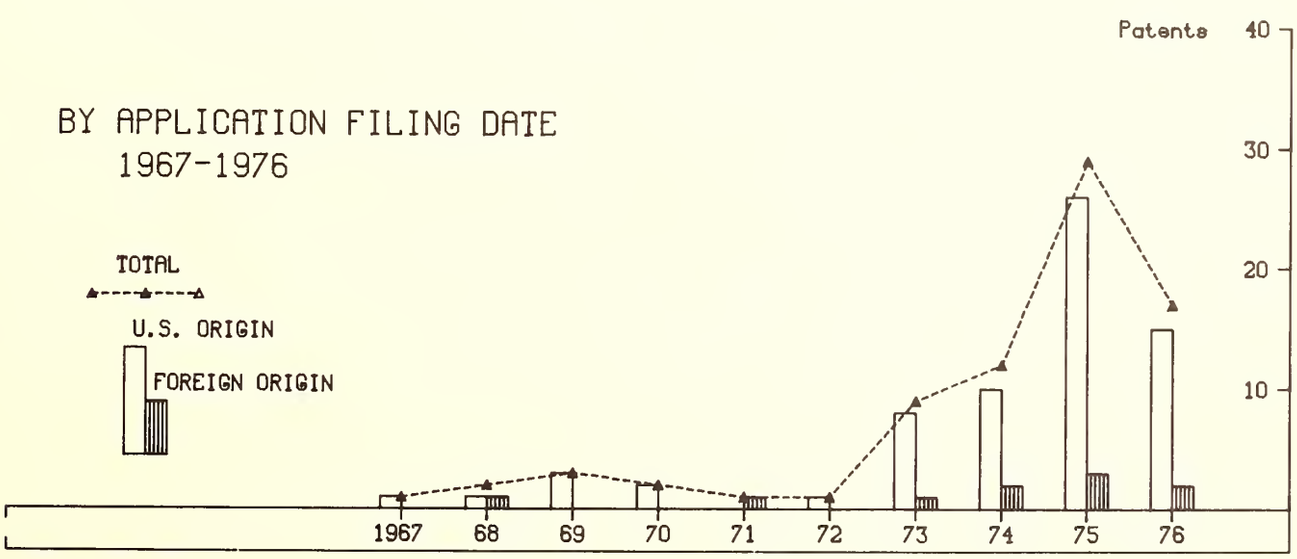
GROWTH	76.5%
FOREIGN SHARE	12.9%
CORPORATE OWNED	24.2%
GOVERNMENT OWNED	4.8%
U.S. OWNED OF FOREIGN	0.0%

PATENT ACTIVITY

BY PATENT GRANT DATE
1969-1978



BY APPLICATION FILING DATE
1967-1976



SOLAR ENERGY - DIRECT CONVERSION OF SOLAR ENERGY TO MECHANICAL ENERGY

PATENT ACTIVITY (1963-1978) BY DATE OF PATENT GRANT

	NUMBER OF PATENTS															
	63-64	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	TOTAL
TOTAL	7	4	4	2	1	1	3		4	1	3	7	21	30	11	99
U.S. ORIGIN	7	4	4	2	1	1	2		4		3	7	18	27	9	89
FOREIGN ORIGIN							1			1			3	3	2	10
CANADA							1			1			1	1		4
ITALY													1		1	2
FRANCE													1			1
GERMANY														1		1
JAPAN														1		1
AUSTRALIA															1	1
U.S. ORIGIN	7	4	4	2	1	1	2		4		3	7	18	27	9	89
U.S. CORP. OWNED	2	3	3						1			3	7	1	3	23
U.S. GOVT. OWNED	1			1					1				2	1		6
U.S. INDIV. OWNED	4	1	1	1	1	1	2		2		3	4	9	25	6	60
FOREIGN OWNED																
FOREIGN ORIGIN							1			1			3	3	2	10
U.S. OWNED																
FOREIGN OWNED							1			1			3	3	2	10
FOREIGN CORP.													2	1	1	4
FOREIGN GOVT.																
FOREIGN INDIV.							1			1			1	2	1	6

SOLAR ENERGY - DIRECT CONVERSION OF SOLAR ENERGY TO MECHANICAL ENERGY

PATENT ACTIVITY (PATENTS GRANTED 1/67-12/78) BY DATE OF PATENT APPLICATION

	NUMBER OF PATENTED APPLICATIONS															
	PRE 65	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	TOTAL
TOTAL	2	1		1	2	3	2	1	1	9	12	29	17	4		84
U.S. ORIGIN	2	1		1	1	3	2		1	8	10	26	15	4		74
FOREIGN ORIGIN					1			1		1	2	3	2			10
CANADA					1			1				1	1			4
ITALY										1			1			2
FRANCE											1					1
GERMANY												1				1
JAPAN												1				1
AUSTRALIA											1					1
U.S. ORIGIN	2	1		1	1	3	2		1	8	10	26	15	4		74
U.S. CORP. OWNED						1			1	2	5	3	1	2		15
U.S. GOVT. OWNED	1						1					3				5
U.S. INDIV. OWNED	1	1		1	1	2	1			6	5	20	14	2		54
FOREIGN OWNED																
FOREIGN ORIGIN					1			1		1	2	3	2			10
U.S. OWNED																
FOREIGN OWNED					1			1		1	2	3	2			10
FOREIGN CORP.										1	1	1	1			4
FOREIGN GOVT.																
FOREIGN INDIV.					1			1			1	2	1			6

DIRECT CONVERSION OF SOLAR ENERGY TO MECHANICAL ENERGY

ASSIGNEES WITH 1 OR MORE PATENTS (1/69 - 12/78)

UOP INC.	3
AAI CORPORATION	2
UNITED STATES OF AMERICA, DEPARTMENT OF ENERGY	2
UNITED STATES OF AMERICA, NATIONAL AERONAUTICS AND SPACE ADM	2
AGENCE NATIONALE DE VALORISATION DE LA RECHERCHE ANVAR	2*
BROWN, ANDREW GRAHAM	1
CREATIVE ENTERPRISES INTERNATIONAL	1
BILLI S.P.A.	1
GULF OIL CORPORATION	1
KAY LABORATORIES, INC.	1
FABBRICA ITALIANA MAGNETI MARELLI S.P.A	1
MELVIN CORPORATION	1
MOBIL TYCO SOLAR ENERGY CORP.	1
LAITRAM CORPORATION	1
SCHJELDAHL, G.T., COMPANY	1
THERMO ELECTRON CORPORATION	1
PETERS, WALTER TODD	1
WHEELABRATOR-FRYE, INC.	1

*COMPOSITE TOTAL, SEE APPENDIX A

ASSIGNED PATENTING(1/69 - 12/78) - - ALPHA LISTING

AAI CORPORATION
3994435 - SOLAR ENERGY CONCENTRATING AND COLLECTING ARRANGEMENT AND METHOD
4004574 - SOLAR ENERGY CONCENTRATING AND COLLECTING ARRANGEMENT WITH SUN-FOLLOWER AND SOLAR ENERGY SENSING POWER CONTROL AND METHOD

AGENCE NATIONALE DE VALORISATION DE LA RECHERCHE ANVAR
3937599 - PUMPING SYSTEM USING SOLAR ENERGY

AGENCE NATIONALE DE VALORISATION DE LA RECHERE (ANVAR)
4010732 - MULTI-STAGE SYSTEM FOR ACCUMULATION OF HEAT FROM SOLAR RADIANT ENERGY

BILLI S.P.A.
3938355 - METHOD OF KNITTING A PLURALITY OF CONVERGENT TUBULAR PORTIONS AND RESULTING ARTICLE

BROWN; ANDREW GRAHAM
4068476 - SOLAR DRIVEN POWER UNIT

CREATIVE ENTERPRISES INTERNATIONAL
3659960 - TRANSMISSION OF FLUIDS THROUGH A PIPELINE

FABBRICA ITALIANA MAGNETI MARELLI S.P.A.
4118638 - SYSTEM OF DISTRIBUTING PILOT SIGNALS

GULF OIL CORPORATION
3868823 - CONCENTRATOR, METHOD, AND SYSTEM FOR UTILIZING RADIANT ENERGY

KAY LABORATORIES, INC.
3952519 - HEAT TRANSFER SYSTEM EMPLOYING SUPERCOOLED FLUIDS

LAITRAM CORPORATION
3984985 - SOLAR ENGINE

MELVIN CORPORATION
3906727 - HYDROSTATIC DRIVE WITH DIRECTION MEMORY

MOBIL TYCO SOLAR ENERGY CORP.
3976508 - TUBULAR SOLAR CELL DEVICES

PETERS WALTER TODD
3995429 - APPARATUS FOR GENERATING POWER USING ENVIRONMENTAL TEMPERATURE DIFFERENTIALS

SCHJELDAHL, G. T., COMPANY
3924604 - SOLAR ENERGY CONVERSION SYSTEM

THERMO ELECTRON CORPORATION
3962873 - SOLAR STEAM GENERATOR

UNITED STATES OF AMERICA, DEPARTMENT OF ENERGY
3982526 - TURNING COLLECTORS FOR SOLAR RADIATION
4044752 - SOLAR COLLECTOR WITH ALTITUDE TRACKING

ASSIGNED PATENTING(1/69 - 12/78) - - ALPHA LISTING

UNITED STATES OF AMERICA, NATIONAL AERONAUTICS AND SPACE ADM
3678685 - SOLAR ENERGY POWERED HELIOTROPE
3987630 - MECHANICAL THERMAL MOTOR

UOP INC.
4072579 - POWER GENERATION AND POTABLE WATER RECOVERY FROM SALINOUS WATER
4078975 - SOLAR POTABLE WATER RECOVERY AND POWER GENERATION FROM SALINOUS WATER
4078976 - SOLAR POTABLE WATER RECOVERY AND POWER GENERATION FROM SALINOUS WATER

WHEELABRATOR-FRYE INC.
3989417 - APPARATUS FOR CONVERTING SOLAR ENERGY INTO MECHANICAL ENERGY

UNASSIGNED PATENTS (1/75-12-78) INVENTDRS (ALPHA LISTING)

INVENTDR NAME			STREET	CITY	ST	ZIP/CNTRY
ARTHUR	DAVID	M.	4020 N. 14TH AVE.	PHDENIX	AZ	85013
4010614 - SOLAR RADIATIDN CDLLECTDR AND SYSTEM FOR CDNVERTING AND STDRING COLLECTED SDLAR ENERGY						
BRINJEVEC	HEINZ	J.	3990 RIBERDY ROAD	WINDSDR, DNTARID		CA
4047385 - SDLAR TO ELECTRICAL ENERGY CDNVERTING SYSTEM						
BRYCE	NDRMAN	K.	P.D. BDX 685	PIMA	AZ	85543
3999389 - SOLAR ENERGY CONVERTER						
BURNETT	JAMES	T.	RIVER BANK RDAD	BATESVILLE	AR	72501
4031702 - MEANS FDR ACTIVATING HYDRAULIC MOTDRS						
BUTLER	TDNY	W. JR.	3224 TIMMDNS LANE, NO. 136	HDUSTDN	TX	77027
4004427 - ENERGY CONVERSIDN SYSTEM						
CHEVALIER	DDNALD	M.	248 15TH AVE. S.	GREAT FALLS	MT	59405
3968652 - APPARATUS RESPONSIVE TD SOLAR ENERGY FDR PRODUCING POWER						
CLARK	RDBERT	O.	1921 TRUMAN NE.	ALBUQUERQUE	NM	87110
3998056 - SDLAR ENERGY APPARATUS AND METHDD						
DECKER	BERT	J.	136 CDPEN BLVD.	BUFFALD	NY	14226
4122356 - SDLAR HEAT PIPE FEEDBACK TURBDGENERATOR						
DEGEUS	ARIE	M.	6625 - 4TH ST. SDUTH	ST. PETERSBURG		33
4081966 - SOLAR DPERATED CLDSED SYSTEM POWER GENERATDR						
DIMITROFF	BDRIS		4014 PERLITA AVE. ND. 6	LDS ANGELES	CA	90039
4068474 - APPARATUS AND PRDCESS FDR STEAM GENERATIDN BY SOLAR ENERGY						
DIX	SYDNEY		48 THE PDINT	CORDNADD	CA	92118
3965683 - SDLAR ELECTRICAL GENERATING SYSTEM						
DRUCKER	ERNEST	R.	86 SAGINAW CRESCENT	DTTAWA		CA
3979597 - SDLAR PDWER PLANT						
ERB	GEORGE	H.	RTE. 103	CUTTINGSVILLE	VT	05738
3986354 - METHDD AND APPARATUS FDR RECOVERING LOW-TEMPERATURE INDUSTRIAL AND SOLAR WASTE HEAT ENERGY PREVIDUSLY DISSIPATED TD AMBIENT						
FLETCHER	JAMES	C.		ADMINISTRATDR DF THE	CA	
4065053 - LDW CDST SDLAR ENERGY CDLLECTIDN SYSTEM						
FLETCHER	JAMES	C.		LA CANADA	CA	
4044753 - SOLAR ENERGY CDLLECTIDN SYSTEM						
FLETCHER	JAMES	C.		MONTEREY PARK	CA	
3972651 - SDLAR-PDWERED PUMP						
GARRETT	DDNALD	E.	505 W. NINTH ST.	CLAREMONT	CA	91711
4063419 - ENERGY PRDDUCTIDN FRDM SDLAR PDNDS						

UNASSIGNED PATENTS (1/75-12-78) INVENTORS (ALPHA LISTING)

INVENTOR NAME	STREET	CITY	ST	ZIP/CNTRY
GILDERSLEEVE OLIVER DEP. JR.	109 DEEPDALE ROAD	STRAFFORD	PA	19087
4038557 - PARTICULATE ENERGY ABSORBER				
GLICKMAN LEONARD	3001 N. BAY RD.	MIAMI BEACH	FL	33140
3903700 - SUNSHINE HYDRO ELECTRICITY				
HENDRIX ARNOLD P.	RTE. 1, BOX 775	ATOKA	TN	38004
4031702 - MEANS FOR ACTIVATING HYDRAULIC MOTORS				
HORTON PAUL F.	9393 HACKAMORE DRIVE	BOISE	ID	83705
4006594 - SOLAR POWER PLANT				
HUNGER GEORGE A. JR.	410 W. PALMER ST.	MORRISVILLE	PA	19067
4038557 - PARTICULATE ENERGY ABSORBER				
JAHN ARNOLD	1124 N. ELM ST.	FAIRMONT	MN	56031
3905352 - SYSTEM FOR COLLECTING AND TRANSFERRING USABLE SOLAR HEAT				
3998206 - SYSTEM FOR COLLECTING AND UTILIZING SOLAR ENERGY				
KELLY DONALD A.	58 - 06 69TH PLACE	MASPETH	NY	11378
4023368 - HIGH DENSITY-THIRD DIMENSION GEOMETRY SOLAR PANELS				
KIRSTEN CHARLES C.		MONTEREY PARK	CA	
3972651 - SOLAR-POWERED PUMP				
KRAUS EDMUND J.	14160 REDHILL	TUSTIN	CA	92680
4055948 - SOLAR THERMAL-RADIATION, ABSORPTION AND CONVERSION SYSTEM				
MARTIN WILLIAM A.	804 VIA BELLA MARIA	SAN MARCOS	CA	92069
3901036 - TWO FLUID SOLAR BOILER				
MATOVICH MITCHEL J. JR.	19354 ZINFANDEL COURT	SARATOGA	CA	95070
4055956 - HIGH TORQUE SOLAR MOTOR				
MCFARLAND LORRELL C.	417 E. 12	CLAREMORE	OK	74017
3983704 - SOLAR OPERATED THERMODYNAMIC DRIVE				
MECKLER MILTON	16348 TUPPER ST.	SEPULVEDA	CA	91343
4024908 - SOLAR POWERED HEAT RECLAMATION AIR CONDITIONING SYSTEM				
MILLER CHARLES G.		PASADENA	CA	
4065053 - LOW COST SOLAR ENERGY COLLECTION SYSTEM				
NEWLAND ELWOOD L.	2434 CLAYWARD ST.	FLINT	MI	48506
4033126 - SOLAR ENERGY DEVICE				
OTHMER DONALD F.	333 JAY ST.	BROOKLYN	NY	11201
3928145 - PROCESS FOR PRODUCING POWER, FRESH WATER, AND FOOD FROM THE SEA AND SUN				
PARKER ALFRED B.	2937 SW. 27TH AVE.	MIAMI	FL	33133
4024715 - SOLAR REACTOR ENGINE				

UNASSIGNEO PATENTS (1/75-12-78) INVENTORS (ALPHA LISTING)

INVENTOR NAME			STREET	CITY	ST	ZIP/CNTRY
PARKER	ALFREO	B.	2937 SW. 27TH AVE.	MIAMI	FL	33133
4026112 - SOLAR REACTOR ENGINE						
POLYAK	JACK		1015 KELLY AVE.	JOLIET	IL	60435
4122675 - SOLAR HEAT SUPPLEMENTED CONVECTION AIR STACK WITH TURBINE BLAOES						
POWELL	WILLIAM	R.	10403 MAY WINO COURT	COLUMBIA	MO	21044
4033118 - MASS FLOW SOLAR ENERGY RECEIVER						
RAOEBOLO	REINHART		QUASTENHORNWEG 14A	1 BERLIN 22		OT
4002158 - SUPPORT STRUCTURE FOR SOLAR ENERGY CONVERTER						
RAY	EOWARO	O.	2615 NW. 46TH PLACE	LAWTON	OK	73505
4075847 - OIRECT CONVERSION OF SOLAR ENERGY TO MECHANICAL ENERGY						
RHOOES	WILLIAM	A.	4421 N. 13TH PLACE	PHOENIX	AZ	85014
4027480 - HYORAULIC ENGINE						
RUFF	JOHN	OENIS	206 BIRCH ST.	ALEXANORIA	VA	22305
4018581 - SOLAR HEATING SYSTEM						
SCHWEITZER	EARL	O.	29353 LUXONA RO.	WICKLIFFE	OH	44092
4094146 - SOLAR ENGINE						
SCRAGG	ROBERT	L.	2937 SW. 27TH AVE.	MIAMI	FL	33133
4024715 - SOLAR REACTOR ENGINE						
4026112 - SOLAR REACTOR ENGINE						
SELCUK	M.	KUORET		LA CANAOA	CA	
4044753 - SOLAR ENERGY COLLECTION SYSTEM						
SHAW	JOHN	B.	1812 E. MARLETTE	PHOENIX	AZ	85016
4028893 - OPEN CYCLE SOLAR ENERGY SYSTEM UTILIZING BUOYANCY AS A CONVERSION FORCE						
SHAW	JOHN	S.	1812 E. MARLETTE	PHOENIX	AZ	85016
4038826 - SOLAR ENERGY SYSTEM UTILIZING BUOYANCY AS A CONVERSION FORCE						
SIEGEL	ISRAEL		351 W. 71 ST.	NEW YORK	NY	10023
4036019 - SOLAR OIFFERENTIAL TEMPERATURE MOTOR						
4041705 - LOW TEMPERATURE ENGINE						
SIEGEL	ISRAEL		351 W. 71ST ST.	NEW YORK	NY	10023
4036017 - LOW PRESSURE ENGINE						
ST. CLAIR	JOHN	C.	BOX 216, R.R. 5	LONOON	OH	43140
3981151 - USE OF SOLAR ENERGY HEAT GATHERING ANO STORING SYSTEMS TO INCREASE FARM CROP YIELOS						
STEPHENS	JAMES	B.		LA CRESCENTA	CA	
4065053 - LOW COST SOLAR ENERGY COLLECTION SYSTEM						
WALORIP	RALPH	L.	8005 STILLBROOKE	MANASSAS	VA	22110
4034735 - SOLAR ENERGY SYSTEM						

UNASSIGNED PATENTS (1/75-12-78) INVENTORS (ALPHA LISTING)

INVENTOR NAME			STREET	CITY	ST	ZIP/CNTRY
WHEELER	PHILLIP	ROOD	209 PINE ST.	ALEXANDRIA	VA	22305
4018581 - SOLAR HEATING SYSTEM						
YATES	JOHN	W.	6005 SIXTH ST.	TAMPA	FL	33611
4051678 - THERMAL PANEL POWERED HEAT ENGINE						

PATENTS (1/63-12/78) WITH NEITHER ASSIGNMENT NOR INVENTOR INFORMATION IN DATABASE

3436908 - SOLAR AIR MOVING SYSTEM
3490996 - SOLAR HEATED WATER VAPOR LIFTING AND CONDENSING SYSTEM
3509716 - SOLAR ENERGY THERMODYNAMIC MOTOR
3514942 - SOLAR HEAT TRANSDUCER APPARATUS
3654759 - APPARATUS FOR CONVERTING SOLAR ENERGY TO LOW COST POWER
3680307 - HEAT ENERGY TRANSFER DEVICE
3752395 - WIND MOTOR OPERATED HEATING SYSTEM
3822692 - CONTROLLED SOLAR ENERGIZED POWER GENERATOR
3832853 - WIND AND SOLAR ENERGY CONVERSION SYSTEM FOR MULTI-STORY BUILDINGS
3841738 - CURVED PAPER PANEL REFLECTIVE STRUCTURE

3089670	3097480	3112862	3121265	3137125	3152260	3152442	3203167	3213284	3213285	3216199	3234738
3279527	3282327	3287901	3309012	3348374	3364676	0	0	0	0	0	0

DIRECT CONVERSION OF SOLAR ENERGY TO MECHANICAL ENERGY

PATENTING UPDATE (1/79-10/79)

Patent No.	Assignee & Title
4,135,367	National Aeronautics And Space Adm.: Thermal Energy Transformer
4,138,850	Dimiter I. Tchernev, 9 Woodman Rd., Chestnut Hill, MASS: Sorption System For Low Grade (Solar) Heat Utilization
4,141,218	Eric R. Rayboy, Apt. No. J-215, 11273 N. Kendall Dr., Miami, FLA 33176: Bouyancy Operated Sunmill
4,143,517	Elmer Compton, 6038 W. Catalina, Phoenix, AZ 85033: Thermal Energy
4,144,716	Edsal Chromie, 6720 Belle Glade, San Diego, CA 92119: Solar Powered Engine And Tracking System
4,147,414	William H. Raser, 6451 W. 83rd St., Los Angeles, CA 90045: Sunlight Concentrator For Energy Conversion
4,150,923	John C. Wardman, 1060 San Tomas Aquino Rd., Campbell, CA 95008: Reciprocating Pump Powered By Solar And Wind Energy
4,159,629	A.L. Korr Associates, Inc.: Apparatus For The Collection And Conversion Of Solar Energy
4,167,856	Messerschmitt-Bolkow Blohm: Solar-Thermal Power Plant

SOLAR COLLECTORS AND CONCENTRATORS

This profile includes systems and elements which are intended to collect and/or concentrate solar radiation so that its energy may be used directly or converted to other forms of energy. The collector or concentrator element is usually in the form of a lens or a reflector.

ACTIVITY INDICES (1976-1978)

GROWTH	66.7%
FOREIGN SHARE	12.0%
CORPORATE OWNED	35.9%
GOVERNMENT OWNED	7.6%
U.S. OWNED OF FOREIGN	9.1%

INCLUDED IN THIS PROFILE ARE ALL OF THE PATENTS FROM:

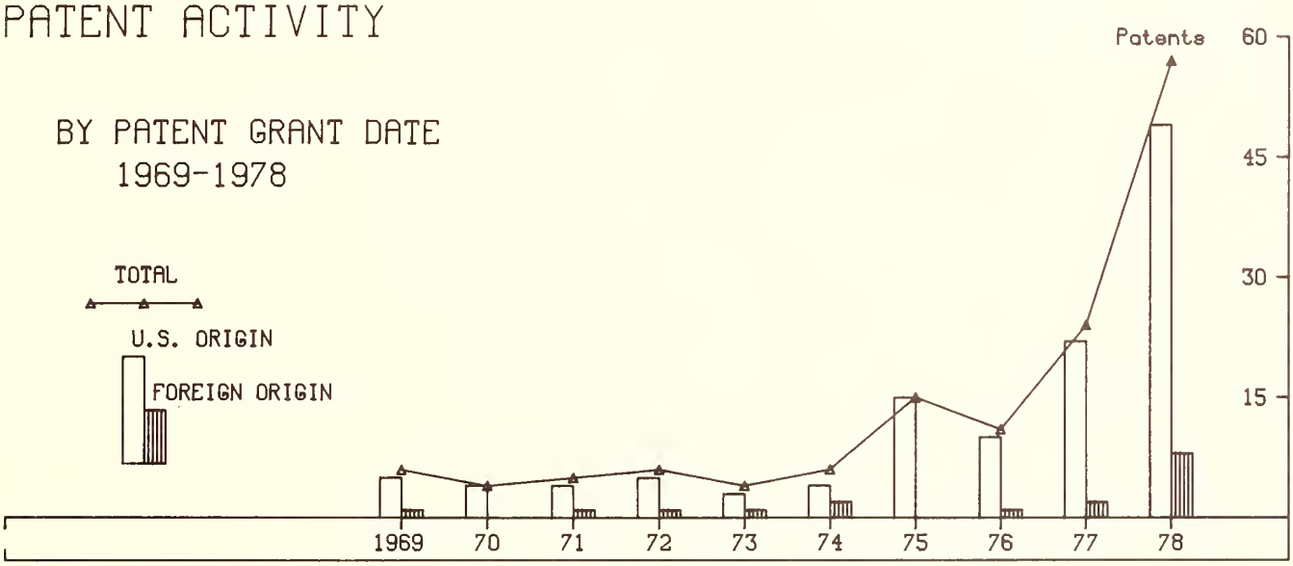
Class 353, Subclass 3

AND SELECTED PATENTS FROM:

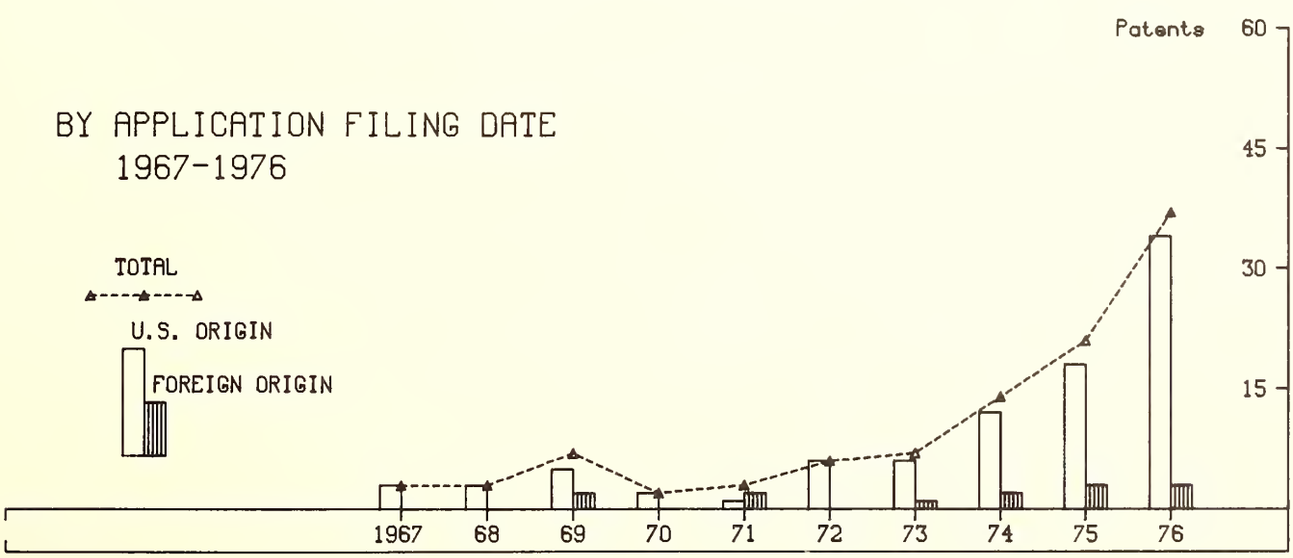
Class 60, Subclasses 398,641,698
Class 244, Subclasses 58,168,173
Class 350, Subclasses 211, 288-290,292-296,299, 300
Class 416, Subclasses 37, 41, 85
Class 417, Subclass 334

PATENT ACTIVITY

BY PATENT GRANT DATE
1969-1978



BY APPLICATION FILING DATE
1967-1976



SOLAR ENERGY - SOLAR COLLECTORS AND CONCENTRATORS

PATENT ACTIVITY (1963-1978) BY DATE OF PATENT GRANT

	NUMBER OF PATENTS															
	63-64	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	TOTAL
TOTAL	11	7	7	3	4	6	4	5	6	4	6	15	11	24	57	170
U.S. ORIGIN	9	7	7	2	3	5	4	4	5	3	4	15	10	22	49	149
FOREIGN ORIGIN	2			1	1	1		1	1	1	2		1	2	8	21
SWITZERLAND											1				4	5
JAPAN								1			1			1		3
SOUTH AFRICA	1													1		2
GERMANY				1					1							2
ARGENTINA															1	1
FRANCE															1	1
SWEDEN													1			1
INDONESIA					1											1
U.S.S.R.										1						1
ITALY						1										1
NIGERIA															1	1
MOROCCO	1															1
AUSTRALIA															1	1
U.S. ORIGIN	9	7	7	2	3	5	4	4	5	3	4	15	10	22	49	149
U.S. CORP. OWNED	5	3	5	1	2	1	2	3	4	2	2	7	3	9	17	66
U.S. GOVT. OWNED	1		1	1			1			1	1	2	4		3	15
U.S. INDIV. OWNED	3	4	1		1	4	1	1	1		1	6	3	13	29	68
FOREIGN OWNED																
FOREIGN ORIGIN	2			1	1	1		1	1	1	2		1	2	8	21
U.S. OWNED					1				1						1	3
FOREIGN OWNED	2			1		1		1		1	2		1	2	7	18
FOREIGN CORP.										1	1		1	1	1	5
FOREIGN GOVT.																
FOREIGN INDIV.	2			1		1		1			1			1	6	13

SOLAR ENERGY - SOLAR COLLECTORS AND CONCENTRATORS

PATENT ACTIVITY (PATENTS GRANTED 1/67-12/78) BY DATE OF PATENT APPLICATION

	NUMBER OF PATENTED APPLICATIONS															
	PRE 65	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	TOTAL
TOTAL	7	2	5	3	3	7	2	3	6	7	14	21	37	25	3	145
U.S. ORIGIN	5	2	4	3	3	5	2	1	6	6	12	18	34	22	3	126
FOREIGN ORIGIN	2		1			2		2		1	2	3	3	3		19
SWITZERLAND										1			2	2		5
JAPAN						1		1				1				3
SOUTH AFRICA												1				1
GERMANY	1					1										2
ARGENTINA													1			1
FRANCE														1		1
SWEDEN											1					1
INDONESIA	1															1
U.S.S.R.								1								1
ITALY			1													1
NIGERIA												1				1
MOROCCO																
AUSTRALIA											1					1
U.S. ORIGIN	5	2	4	3	3	5	2	1	6	6	12	18	34	22	3	126
U.S. CORP. OWNED	4		1	1	2	5	2		4	3	3	6	12	8	2	53
U.S. GOVT. OWNED	1			1					2		4	2	1	2		13
U.S. INDIV. OWNED		2	3	1	1			1		3	5	10	21	12	1	60
FOREIGN OWNED																
FOREIGN ORIGIN	2		1			2		2		1	2	3	3	3		19
U.S. OWNED	1					1								1		3
FOREIGN OWNED	1		1			1		2		1	2	3	3	2		16
FOREIGN CORP.								2			1	1		1		5
FOREIGN GOVT.																
FOREIGN INDIV.	1		1			1				1	1	2	3	1		11

SOLAR COLLECTORS AND CONCENTRATORS

ASSIGNEES WITH 1 OR MORE PATENTS (1/69 -12/78)

UNITED STATES OF AMERICA, NATIONAL AERONAUTICS AND SPACE ADM	6*
WESTINGHOUSE ELECTRIC CORP.	4
UNITED STATES OF AMERICA, DEPARTMENT OF ENERGY	4
GENERAL DYNAMICS CORPORATION	3
UOP INC.	3
BOEING COMPANY	2
MINNESOTA MINING AND MANUFACTURING COMPANY	2
GOODYEAR AEROSPACE CORPORATION	2
THE UNIVERSITY OF CHICAGO	2
BAUSCH + LOMB, INCORPORATED	2
OWENS-ILLINOIS INC.	2
AGENCE NATIONALE DE VALORISATION DE LA RECHERCHE ANVAR	1
BROWN, ANDREW GRAHAM	1
ECOTHERMIA, INC.	1
BOURDON, LEO	1
EREVANSKOE OTDELENIE VSESOJUZ-NOGO PROEKTNOISSLEDOVATELSKO-G	1
E-SYSTEMS, INC.	1
EMERSON ELECTRIC CO.	1
AEROJET-GENERAL CORPORATION	1
GRUMMAN AEROSPACE CORPORATION	1
GULF OIL CORPORATION	1
INFRARODTEKNIK, AB	1
ITEK CORPORATION	1
LAITRAM CORPORATION	1
MASSACHUSETTS INSTITUTE OF TECHNOLOGY	1
MOBIL TYCO SOLAR ENERGY CORP.	1
MEGA ANALYTICAL RESEARCH SERVICES, INC.	1
NEOTEC CORPORATION	1
MOTOROLA INC.	1
ARGUS ENGINEERING COMPANY	1
OAK RIDGE SOLAR ENGINEERING, INC.	1
PERKIN-ELMER CORPORATION	1
PITNEY-BOWES, INC.	1
RAYTHEON COMPANY	1
ROHR INDUSTRIES INC.	1
SANDERS ASSOCIATES INC.	1
SCHJELDAHL, G.T., COMPANY	1
SOLAR DYNAMICS CORPORATION	1
TRW INC.	1
SUEHIRO SEIKI COMPANY, LTD.	1
UNITED STATES OF AMERICA, NAVY	1
UNITED TECHNOLOGIES CORPORATION	1
GENERAL ATOMIC COMPANY	1
GENERAL ELECTRIC COMPANY	1
BATTELLE DEVELOPMENT CORPORATION	1
UNIVERSITY OF KENTUCKY RESEARCH FOUNDATION	1
VARIAN ASSOCIATES, INC.	1
UNITED STATES OF AMERICA, AIR FORCE	1
NIPPON ELECTRIC COMPANY, LTD.	1

*COMPOSITE TOTAL, SEE APPENDIX A

ASSIGNED PATENTING(1/69 - 12/78) - - ALPHA LISTING

AEROJET-GENERAL CORPORATION
3427200 - LIGHT CONCENTRATOR TYPE PHOTOVOLTAIC PANEL HAVING CLAMPING MEANS FOR RETAINING PHOTOVOLTAIC CELL

AGENCE NATIONALE DE VALORISATION DE LA RECHERCHE ANVAR
4129360 - HELIOSTATS

ARGUS ENGINEERING COMPANY
3600553 - METHOD AND APPARATUS FOR HEATING A PLURALITY OF CLOSELY SPACED DISCRETE ZONES BY A SINGLE ENERGY SOURCE

BATTELLE DEVELOPMENT CORPORATION
4117829 - FUR-LIKE PHOTOTHERMAL CONVERTER SURFACE

BAUSCH + LOMB, INCORPORATED
3645600 - HEAT ABSORBING REFLECTOR UTILIZING A METALLIC SUBSTRATE
4118761 - LIGHT CONDENSING ILLUMINATOR

BOEING COMPANY
3497377 - MIRROR CONFIGURATIONS
3912380 - COMPOSITE TYPE STRUCTURE FOR LARGE REFLECTIVE MIRRORS

BOURDON; LEO
4068653 - SOLAR HEATING UNIT

BROWN; ANDREW GRAHAM
4068476 - SOLAR DRIVEN POWER UNIT

ECOTHERMIA, INC.
3884217 - METHOD AND APPARATUS FOR COLLECTING SOLAR ENERGY

EMERSON ELECTRIC CO.
4091799 - SELF-TRACKING RADIANT ENERGY COLLECTOR

EREVANSKOE OTDELENIE VSESOJUZ-NOGO PROEKTNOISSLEDOVATELSKO-G
3713727 - SOLAR UNIT

E-SYSTEMS, INC.
4069812 - SOLAR CONCENTRATOR AND ENERGY COLLECTION SYSTEM

GENERAL ATOMIC COMPANY
4071017 - TENSIONED REFLECTOR SUPPORT SYSTEM

GENERAL DYNAMICS CORPORATION
4015653 - PANEL DEPLOYMENT SYSTEM
4056309 - RENEWABLE SURFACE HELIOSTAT TYPE SOLAR MIRROR
4116258 - PANEL DEPLOYMENT AND RETRACTION SYSTEM

GENERAL ELECTRIC COMPANY
4106085 - HVDC FLOATING CURRENT ORDER SYSTEM

GOODYEAR AEROSPACE CORPORATION
3574447 - MULTI-CURVED REFLECTOR
3607584 - LAMINATED LIGHTWEIGHT REFLECTOR STRUCTURES

ASSIGNED PATENTING(1/69 - 12/78) - - ALPHA LISTING

GRUMMAN AEROSPACE CORPORATION
4030102 - DEPLOYABLE REFLECTOR STRUCTURE

GULF OIL CORPORATION
3868823 - CONCENTRATOR, METHOD, AND SYSTEM FOR UTILIZING RADIANT ENERGY

INFRAROTEKNIK AB
3966308 - DEVICE FOR REFLECTING RADIANT ENERGY

ITEK CORPORATION
3869199 - SOLAR ENERGY ABSORBER

LAITRAM CORPORATION
4088121 - SOLAR ENERGY CONCENTRATOR

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
4086485 - SOLAR-RADIATION COLLECTION APPARATUS WITH TRACKING CIRCUITRY

MEGA ANALYTICAL RESEARCH SERVICES, INC.
4106484 - ADJUSTABLE SOLAR CONCENTRATOR

MINNESOTA MINING AND MANUFACTURING COMPANY
4035064 - LIGHT CONCENTRATOR HAVING AN ANTICLASTIC REFLECTIVE SURFACE
4108540 - REFRACTOR-REFLECTOR RADIATION CONCENTRATOR

MOBIL TYCO SOLAR ENERGY CORP.
4045246 - SOLAR CELLS WITH CONCENTRATORS

MOTOROLA INC.
4131485 - SOLAR ENERGY COLLECTOR AND CONCENTRATOR

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
3936942 - OPTICAL PANTOGRAPH

NEOTEC CORPORATION
3717879 - COLLAPSIBLE REFLECTOR

NIPPON ELECTRIC COMPANY, LTD.
3801773 - APPARATUS FOR HEATING A SAMPLE WITH RADIATION ENERGY CONCENTRATED BY A REFLECTOR ESSENTIALLY COMPOSED OF SPHEROIDAL SURF
ACE PORTIONS

OAK RIDGE SOLAR ENGINEERING, INC.
3964464 - SOLAR RADIATION COLLECTOR AND CONCENTRATOR

OWENS-ILLINOIS INC.
4048982 - BULB-TYPE SOLAR ENERGY COLLECTOR
4048983 - SOLAR ENERGY COLLECTOR APPARATUS

PERKIN-ELMER CORPORATION
4082413 - SELECTIVE RADIATION ABSORPTION DEVICES FOR PRODUCING HEAT ENERGY

ASSIGNED PATENTING(1/69 - 12/78) - - ALPHA LISTING

PITNEY-BOWES, INC.
3664445 - AVAILABLE LIGHT ILLUMINATED INSTRUMENT READ-OUT

RAYTHEON CORPORATION
3841737 - LAMINATED MIRROR

ROHR INDUSTRIES INC.
3977773 - SOLAR ENERGY CONCENTRATOR

SANDERS ASSOCIATES INC.
4121564 - SOLAR ENERGY RECEIVER

SCHJELDAHL, G. T., COMPANY
3924604 - SOLAR ENERGY CONVERSION SYSTEM

SOLAR DYNAMICS CORPORATION
4003756 - DEVICE FOR CONVERTING SUNLIGHT INTO ELECTRICITY

SUEHIRO SEIKI COMPANY, LTD.
4034737 - SOLAR HEAT BOILER

THE UNIVERSITY OF CHICAGO
3899672 - SOLAR ENERGY COLLECTION
3923381 - RADIANT ENERGY COLLECTION

TRW INC.
3494231 - METHOD OF MAKING A FACET OF A MULTI-FACET PARABOLOIDAL COLLIMATOR

UNITED STATES OF AMERICA, AIR FORCE
3799144 - SOLAR HEAT SOURCE AND RECEIVER SYSTEM

UNITED STATES OF AMERICA, DEPARTMENT OF ENERGY
3957031 - LIGHT COLLECTORS IN CYLINDRICAL GEOMETRY
4099515 - FABRICATION OF TROUGH-SHAPED SOLAR COLLECTORS
4114592 - CYLINDRICAL RADIANT ENERGY DIRECTION DEVICE WITH REFRACTIVE MEDIUM
4120565 - PRISMS WITH TOTAL INTERNAL REFLECTION AS SOLAR REFLECTORS

UNITED STATES OF AMERICA, NATIONAL AERONAUTICS AND SPACE ADM
3490405 - METHOD AND APPARATUS FOR MAKING CURVED REFLECTORS
3915148 - THERMOSTATICALLY CONTROLLED NON-TRACKING TYPE SOLAR ENERGY CONCENTRATOR
3927227 - METHOD FOR MANUFACTURING MIRRORS IN ZERO GRAVITY ENVIRONMENT
3957030 - SOLAR ENERGY POWER SYSTEM
3958553 - SOLAR ENERGY TRAP

UNITED STATES OF AMERICA, NAVY
3780722 - FIBER OPTICAL SOLAR COLLECTOR

UNITED TECHNOLOGIES CORPORATION
3644020 - VARIABLE CONTOUR REFLECTOR WITH COOLING SYSTEM

ASSIGNED PATENTING(1/69 - 12/78) - - ALPHA LISTING

UNIVERSITY OF KENTUCKY RESEARCH FOUNDATION
4026273 - SOLAR FLUID HEATER WITH ELECTROMAGNETIC RADIATION TRAP

UOP INC.
4072579 - POWER GENERATION AND POTABLE WATER RECOVERY FROM SALINOUS WATER
4078975 - SOLAR POTABLE WATER RECOVERY AND POWER GENERATION FROM SALINOUS WATER
4078976 - SOLAR POTABLE WATER RECOVERY AND POWER GENERATION FROM SALINOUS WATER

VARIAN ASSOCIATES, INC.
4115149 - CONCENTRATOR ARRANGEMENT FOR PHOTOVOLTAIC CELL

WESTINGHOUSE ELECTRIC CORP.
3635547 - REFLECTOR CONSTRUCTION
3781095 - REFLECTOR
3843238 - REFLECTOR
3951510 - INERTIALLY STABILIZED HELIOSTAT ASSEMBLY

UNASSIGNED PATENTS (1/75-12-78) INVENTORS (ALPHA LISTING)

INVENTOR NAME	STREET	CITY	ST	ZIP/CNTRY
ABRAMS EUGENE	ONE SWALE RD.	FRANKLIN SQUARE	NY	11010
3902794 - FRESNELL LENS				
ANDERSON HENRY JR.	9401 SEMINOLE ST.	SILVER SPRING	MD	20901
3861379 - LOW PROFILE SOLAR RAY CONCENTRATOR				
ARBOGAST PORTER R.	281 W. LANGHORNE AVE.	BETHLEHEM	PA	18017
4056313 - MULTIPLE MIRRORED APPARATUS UTILIZING SOLAR ENERGY				
ARNBERG B. THOMAS	2885 KENYON CIRCLE	BOULDER	CO	80303
4047517 - METHOD AND APPARATUS FOR RECEIVING SOLAR ENERGY				
BENSON PHILLIP D.	2026 E. LAKESHORE DR.	AGOURA	CA	91301
4090498 - SOLAR HEATER				
BEZBORODKO JOSEPH A.	699 W. 239TH ST.	BRONX	NY	10463
4038971 - CONCAVE, MIRRORED SOLAR COLLECTOR				
BRUECK CHRIS M.	615 CHESTNUT	MUSCATINE	IA	52761
4130109 - SOLAR ENERGY CONCENTRATOR				
BRYNJESTAD ULF	1047 W. ASHBRIDGE LA.	HARBOR CITY	CA	90710
4103673 - NON-TRACKING SOLAR ENERGY CONCENTRATOR				
BUNCH JESSE C.	1008 KERWIN RD.	SILVER SPRING	MD	20901
4110009 - HELIOSTAT APPARATUS				
BUTLER DAVID M.	46 FARRAGUT ROAD	ANNAPOLIS	MD	21403
4075034 - SOLAR CONVERTER				
CAPLAN HARRY W.	3397 E. MONMOUTH RD.	CLEVELAND HEIGHTS	OH	44118
3906927 - SOLAR-THERMAL POWER SYSTEM EMPLOYING ADJUSTABLE CURVATURE REFLECTIVE PANELS AND METHOD OF ADJUSTING REFLECTIVE PANEL CUR VATURE				
CHANG WEI-YI	9605 LA PLAYA ST, NE.	ALBUQUERQUE	NM	87111
4114596 - METHOD AND APPARATUS FOR TRACKING THE SUN FOR USE IN A SOLAR COLLECTOR WITH LINEAR FOCUSING MEANS				
DECKER BERT J.	136 COPEN BLVD.	BUFFALO	NY	14226
4122356 - SOLAR HEAT PIPE FEEDBACK TURBOGENERATOR				
DEGEUS ARIE M.	6625 - 4TH ST. SOUTH	ST. PETERSBURG		33
4081966 - SOLAR OPERATED CLOSED SYSTEM POWER GENERATOR				
DEPEW WALTER L.	3111 W. 54TH AVE.	DENVER	CO	80221
4064865 - SOLAR ACTUATED BOILER AND APPURTENANCES				
DIMITROFF BORIS	4014 PERLITA AVE. NO. 6	LOS ANGELES	CA	90039
4068474 - APPARATUS AND PROCESS FOR STEAM GENERATION BY SOLAR ENERGY				
DIX SYDNEY	48 THE POINT	CORONADO	CA	92118
3965683 - SOLAR ELECTRICAL GENERATING SYSTEM				

UNASSIGNED PATENTS (1/75-12-78) INVENTORS (ALPHA LISTING)

INVENTOR NAME			STREET	CITY	ST	ZIP/CNTRY
DOLAMORE	PETER	WILLIAM	P.O. BOX 10142	JOHANNESBURG		ZA
4050444 - REFLECTIVE DEVICE						
FLETCHER	JAMES	C.		ADMINISTRATOR OF THE	CA	
4065053 - LOW COST SOLAR ENERGY COLLECTION SYSTEM						
FLETCHER	JAMES	C.		ALTADENA	CA	
4111184 - SUN TRACKING SOLAR ENERGY COLLECTOR						
FLETCHER	JAMES	C.		LA CANADA	CA	
4044753 - SOLAR ENERGY COLLECTION SYSTEM						
FLETCHER	JAMES	C.		LACANADA	CA	
4091798 - NON-TRACKING SOLAR ENERGY COLLECTOR SYSTEM						
FLETCHER	JAMES	C.		PASADENA	CA	
4051834 - PORTABLE, LINEAR-FOCUSED SOLAR THERMAL ENERGY COLLECTING SYSTEM						
FROSCH	ROBERT	A.		PASADENA	CA	
4131336 - PRIMARY REFLECTOR FOR SOLAR ENERGY COLLECTION SYSTEMS						
GELLERT	DONALD	P.	BOX 37, R.F.D. 1	PLYMOUTH	NH	03264
4074704 - PROCESS OF AND APPARATUS FOR SOLAR HEATING AND THE LIKE						
HABERMAN	LOUIS	B.	C/O SOLAREX HYDRAULICS CORP.	DEER PARK	NY	11729
4015584 - PARABOLIC SOLAR ENERGY HEAT EXCHANGER						
HEDGER	JOHN	HENRY	1350 HILL ST.	EL CAJON	CA	92020
4063543 - SERVO TRACKING APPARATUS						
HILTON	RICHARD	D.	RTE. 2, BOX 381-A	KING GEORGE	VA	22485
4110010 - GANGED HELIOSTAT						
JAHN	ARNOLD		1124 N. ELM ST.	FAIRMONT	MN	56031
3905352 - SYSTEM FOR COLLECTING AND TRANSFERRING USABLE SOLAR HEAT						
L'ESPERANCE	PAUL	M.	BOX 482, OAKWOOD LANE	VALLEY FORGE	PA	19481
4024852 - SOLAR ENERGY REFLECTOR-COLLECTOR						
LANG	ROGER		16, CHEMIN DE ROILBOT	CHAMBESY, GENEVA		CH
4112917 - SOLAR-RAY HEATING APPARATUS						
LIEBI	HARALD		BOLGEN	ZWEISIMMEN, CANTON O		CH
4116221 - SOLAR ENERGY COLLECTING AND CONCENTRATING APPARATUS						
LOVELACE	ALAN	M.		LA CANADA	CA	
4122833 - NON-TRACKING SOLAR ENERGY COLLECTOR SYSTEM						
MATLOCK	PATRICIA		2123 S. PRIEST #216	TEMPE	AZ	85282
4109638 - SOLAR ENERGY CONVERTER CAROUSEL						
MEYER	WARREN	A.	612 COMANCHE ST., NE.	ALBUQUERQUE	NM	87107
4114594 - DEVICE FOR SYNCHRONOUSLY ROTATING SOLAR COLLECTORS						

UNASSIGNED PATENTS (1/75-12-78) INVENTORS (ALPHA LISTING)

INVENTOR NAME				STREET	CITY	ST	ZIP/CNTRY
MEYER	WARREN	A.		8612 BELLEHAVEN PL., N.E.	ALBUQUERQUE	NM	87112
4103672 - SOLAR COLLECTOR							
MILLER	CHARLES	G.			PASADENA	CA	
4051834 - PORTABLE, LINEAR-FOCUSED SOLAR THERMAL ENERGY COLLECTING SYSTEM							
4065053 - LOW COST SOLAR ENERGY COLLECTION SYSTEM							
4131336 - PRIMARY REFLECTOR FOR SOLAR ENERGY COLLECTION SYSTEMS							
NORTHRUP	LEONARD	L.	JR.	4312 WESTWAY	DALLAS	TX	75205
3991741 - ROOF-LENS SOLAR COLLECTOR							
4022186 - COMPOUND LENS SOLAR ENERGY SYSTEM							
O'NEILL	MARK	J.		11243 LANEWOOD CIRCLE	DALLAS	TX	75218
3991741 - ROOF-LENS SOLAR COLLECTOR							
PASTOR	JOSE			191 WILTON RD.	WESTPORT	CT	06880
4088116 - RADIANT ENERGY COLLECTOR							
PAULY	LOU	A.		3598 CROCKER ROAD	EUGENE	OR	97407
3993528 - METHOD OF CONSTRUCTING SOLAR FURNACE							
PAVLAK	ALEX			JUG HOLLOW ROAD	PHOENIXVILLE	PA	19460
4024852 - SOLAR ENERGY REFLECTOR-COLLECTOR							
PERKINS	GERALD	S.			ALTADENA	CA	
4111184 - SUN TRACKING SOLAR ENERGY COLLECTOR							
POHL	JENS	G.			SAN LUIS OBISPO	CA	
4051834 - PORTABLE, LINEAR-FOCUSED SOLAR THERMAL ENERGY COLLECTING SYSTEM							
POWELL	ROGER	ANDREW		1455 WHITWOOD DR.	NORRISTOWN	PA	19401
4119365 - TROUGH REFLECTOR							
RADENKOVIC	LJUBOMIR			P.O. BOX 3068	KANO		NG
4121566 - SONIA SYSTEM							
RAPPOPORT	MARC	D.		P.O. BOX 10445	PORTLAND	OR	97210
4099381 - GEOTHERMAL AND SOLAR INTEGRATED ENERGY TRANSPORT AND CONVERSION SYSTEM							
RASER	WILLIAM	H.		6451 W. 83RD ST.	LOS ANGELES	CA	90045
3872854 - SUNLIGHT CONCENTRATOR FOR ENERGY CONVERSION							
RICE	HAROLD	D.		25TH AND MCGEE TRAFFICWAY	KANSAS CITY	MO	64141
4011857 - SOLAR ENERGY CONVERTER AND ELONGATED FRESNEL LENS ELEMENT							
ROGERS	BRUCE	C.		915 GEORGETOWN ROAD	SALEM	OH	44460
3929121 - SOLAR HEAT COLLECTOR							
RUST	RUDOLPH			4562 HEIL, APT. 3	HUNTINGTON BEACH	CA	92649
4040411 - APPARATUS FOR CONCENTRATION OF SOLAR RADIATION							
SCHWEITZER	EARL	D.		29353 LUXONA RD.	WICKLIFFE	OH	44092
4094146 - SOLAR ENGINE							

UNASSIGNED PATENTS (1/75-12-78) INVENTORS (ALPHA LISTING)

INVENTOR NAME			STREET	CITY	ST	ZIP/CNTRY
SELCUK	M.	KUDRET		LA CANADA	CA	
4044753 - SOLAR ENERGY COLLECTION SYSTEM						
4122833 - NON-TRACKING SOLAR ENERGY COLLECTOR SYSTEM						
SELCUK	M.	KUDRET		LACANADA	CA	
4091798 - NON-TRACKING SOLAR ENERGY COLLECTOR SYSTEM						
STEPHENS	JAMES	B.		LA CRESCENTA	CA	
4065053 - LOW COST SOLAR ENERGY COLLECTION SYSTEM						
4131336 - PRIMARY REFLECTOR FOR SOLAR ENERGY COLLECTION SYSTEMS						
TACCHI	VICTORIO		RIOJA 50, 1(DEGREES)PISO DPTO.	CORDOBA		AR
4110986 - SYSTEMS FOR MAKING USE OF THE ENERGY CARRIED BY A FLUID AND SUPPLIED THERETO BY SOLAR ENERGY						
VAN KUIJK	JOSEPHUS	PETRUS	CHEMIN DES VIGNES 85	1814 LA TOUR DE PEIL		CH
4106481 - APPARATUS FOR RECOVERING SOLAR ENERGY						
VASILANTONE	MICHAEL		34 COLUMBIA RD.	SOMERVILLE	NJ	08876
4116223 - SOLAR ENERGY UNIT						
WINDERS	GORDON	ROBERT	204 CHATTERSON DR.	RALEIGH	NC	27609
4107521 - SOLAR SENSOR AND TRACKER APPARATUS						
WIQUEL	ATTILIO-WILLIAM		C/O MONACO GOVERNMENT TOURIST	NEW YORK	NY	10021
4076014 - SOLAR CIGARETTE LIGHTER						
WOODWORTH	ROBERT	N.	2838 GRAYSBY ST.	SAN PEDRO	CA	90732
4103673 - NON-TRACKING SOLAR ENERGY CONCENTRATOR						
WYATT	WILLIAM	G.	8366 GARLAND RD.	DALLAS	TX	75218
4129115 - RADIANT ENERGY COLLECTOR						
YOKE	JAMES	H.	RTE. 15, BOX 395	ACTON	IN	46259
4129119 - SOLAR ENERGY COLLECTOR						
ZAUGG	HANS		WEEKENDWEG 1	EINIGEN, CANTON OF B		CH
4116221 - SOLAR ENERGY COLLECTING AND CONCENTRATING APPARATUS						

PATENTS (1/63-12/78) WITH NEITHER ASSIGNMENT NOR INVENTOR INFORMATION IN DATABASE

3453425 - STRUCTURE FOR CONCENTRATING RADIANT ENERGY
3463577 - SUN REFLECTING BOARD
3466119 - MULTIPLE MIRRORED APPARATUS UTILIZING SOLAR HEAT
3467840 - SOLAR THERMIONIC CONVERTOR
3483871 - SUNTANNING DEVICE
3496941 - SUN-BATHERS REFLECTOR DEVICE
3587559 - WATER-HEATING APPARATUS UTILIZING SOLAR RAYS
3613659 - SOLAR ENERGY CONCENTRATING DEVICE
3656844 - SUN FOLLOWING DEVICE
3670717 - UNLIMITED QUANTITY OF POWER FROM SOLAR RADIATION SECURED WITH ZERO ATMOSPHERIC POLLUTION

PATENTS (1/63-12/78) WITH NEITHER ASSIGNMENT NOR INVENTOR INFORMATION IN DATABASE

3797476 - SOLAR HEATING DEVICE
3841738 - CURVED PAPER PANEL REFLECTIVE STRUCTURE
4130106 - SOLAR STOVE

3085565	3104211	3105486	3118437	3125091	3130084	3144219	3151206	3152260	3153878	3162189	3170172
3171403	3174397	3200820	3203306	3213284	3213285	3229579	3229682	3234931	3247840	3254207	3264467
3286259	3295512	3325238	3326624	3372008	3376165	3406404	3407122	0	0	0	0

SOLAR COLLECTORS AND CONCENTRATORS

PATENTING UPDATE (1/79-10/79)

Patent No.	Assignee & Title
4,132,074	James L. Lowe: Paving And Solar Energy System And Method
4,132,223	E. Garland Reddell, 115 E. 26th St., Yuma, AZ 85364: Tracking System For Solar Energy Collector
4,133,501	Communications Satellite Corporation: Self-Deployable Solar Cell Panel
4,133,502	RCA Corporation: Plural Panels Deployed Effectively As A Single Panel
4,134,387	Mobil Tyco Solar Energy Corporation: Solar Energy Concentrator
4,134,393	Spectrum Conversion, Inc.: Solar Energy Collection
4,135,367	National Aeronautics And Space Adm.: Thermal Energy Transformer
4,135,493	Acurex Corporation: Parabolic Trough Solar Energy Collector Assembly
4,136,671	Carl L. Whiteford, 3 High Point Rd., Westport, CO 06902: Electromagnetic Radiation Reflector
4,136,674	A.L. Korr Associates, Inc.: System For Solar Radiation Energy Collection And Conversion
4,137,897	Walter T. Moore, 782 Mardigras Ct., Camarillo, CA 93010: Unified Array For Collection And Concentration Of Solar Energy
4,138,850	Dimiter I. Tchernev, 9 Woodman Rd., Chestnut Hill, MASS: Sorption System For Low Grade (Solar) Heat Utilization
4,138,994	Robert M. Shipley, Jr., 259 Candlelight Dr., Santa Rosa, CA 95401: Solar Heating Unit
4,139,270	James T. Dotson, Lot No. 109, Rancho Del Sol, Gilbert, AZ 85234: Panel Mounting Apparatus
4,139,286	Leopold A. Hein, Rt. 7 Fayetteville, TN 37334 & William N. Myers, 4306B Boxwood Ct., Huntsville, ALA 35805: Apparatus For Concentrating Solar Energy

4,141,626 FMC Corporation: Method And Apparatus For Collecting Solar Radiation Utilizing Variable Curvature Cylindrical Reflectors

4,142,514 Solation Products, Inc.: Solar Heat Collector

4,144,716 Edsal Chromic, 6720 Belle Glade, San Diego, CA 92119: Solar Powered Engine And Tracking System

4,144,873 Donald F. Porter, 130 Ramsey Pl., Albany, NY 12209: Solar Heat Collector

4,146,408 Richard B. Nelson, Los Altos Hills, CA: Aspherical Solar Cell Concentrator

4,147,158 Chang Chieh-Tsung: Multi-Layered Solar Energy Collector

4,147,414 William H. Raser, 6451 W. 83rd St., Los Angeles, CA 90045: Sunlight Concentrator For Energy Conversion

4,148,163 Societe Nationale Industrielle Aerospatiale: Synchronizing Mechanism For The Unfolding Of Carrier Elements For Solar Cells

4,148,297 Benjamin F. Sherman, Jr., 6329 Mori St., McLean, VA 22101: Collector Of Direct Dispersed And Reflected Waves

4,148,298 Benjamin F. Sherman, Jr., 6329 Mori St., McLean, VA 22101: Hemispherical Collector Of Direct Dispersed And Reflected Waves

4,148,299 Benjamin F. Sherman, Jr., 6329 Mori St., McLean, VA 22101: Hemitoroidal Collector Of Direct Dispersed And Reflected Waves

4,148,564 Commissariat a l'Energie Atomique: Solar Sensor With Linear Concentrator With A Fixed Receiver And Movable Mirrors

4,149,521 James C. Fletcher, Adm. of The National Aeronautics & Space Adm. with respect to an invention of Charles G. Miller, Pasadena, & James B. Stephens, La Crescenta, Both of CA: Solar Energy Collection System

4,149,777 Jesse C. Bunch, 816 Easley St., Silver Spring, MD 20910: Radiation Concentrating System

4,149,817 James C. Fletcher, Adm. of the National Aeronautics & Space Adm. with respect to an invention of Charles G. Miller, Pasadena & James B. Stephens, La Crescenta, Both of CA: Primary Reflectro For Solar Energy Collection Systems & Method Of Making Same

4,150,663 Kenneth J. Sisson, 20 Sunken Meadow Rd., Northport, NY 11768: Solar Energy Collector & Concentrator

4,150,923 John C. Wardman, 1060 San Tomas Aquino Rd., Campbell, Ca 95008: Reciprocating Pump Powered By Solar And Wind Energy

4,153,474 Erno Raumfahrttechnik GmbH, Bremen, Fed. Rep. of Germany: Solar Energy Collector

4,154,219 E-Systems, Inc.: Prismatic Solar Reflector Apparatus And Method Of Solar Tracking

4,155,347 Contraves AG, Switzerland: Solar Radiation Collector

4,155,524 Societe Nationale Industrielle Aerospatiale: Device For the Synchronized Unfolding Of Articulated Elements Carrying Solar Cells In A Panel Formed By A Series Of Articulated Elements

4,159,629 A.L. Korr Associates, Inc.: Apparatus For The Collection And Conversion Of Solar Energy

4,160,577 Pyreflex Corporation: Heat Recuperator

4,161,942 Robert F. Monk, 4640 Country Creek, Apt. 1255, Dallas, TX 75236: Solar Energy Collector

4,162,824 Horace Z. Ma, 1420 Farwood Dr., Lansing, MI 48823: Nonimaging Radiant Energy Collector And Concentrator

4,164,123 Otto J.M. Smith, 612 Euclid Ave., Berkeley, CA 94708: Solar Thermal Electric Power Plant

4,166,446 BBC Brown Boveri & Co., Ltd.: Solar Collector

4,168,696 Donald A. Kelly, 58-06 69th Pl. Maspeth, NY 11378: Four Quadrant, Two Dimensional, Linear Solar Concentration Panels

4,170,985 Agence Nationale de Valorisation de la Recherche (ANVAR): Solar Energy Collector

4,171,695 Solar Energy Technology, Inc.: Image Collapsing Concentrator And Method For Collecting And Utilizing Solar Energy

4,172,443 Warren T. Sommer, 2608 N. Humboldt Blvd., Milwaukee, WI 53212: Central Receiver Solar Collector Using Analog Coupling Mirror Control

4,172,739 Solar Homes, Inc.: Sun Tracker With Dual Axis Support For Diurnal Movement And Seasonal Adjustment

ELECTRICITY GENERATED BY WIND

This profile includes systems and specialized components which generate electricity from wind.

ACTIVITY INDICES (1976-1978)

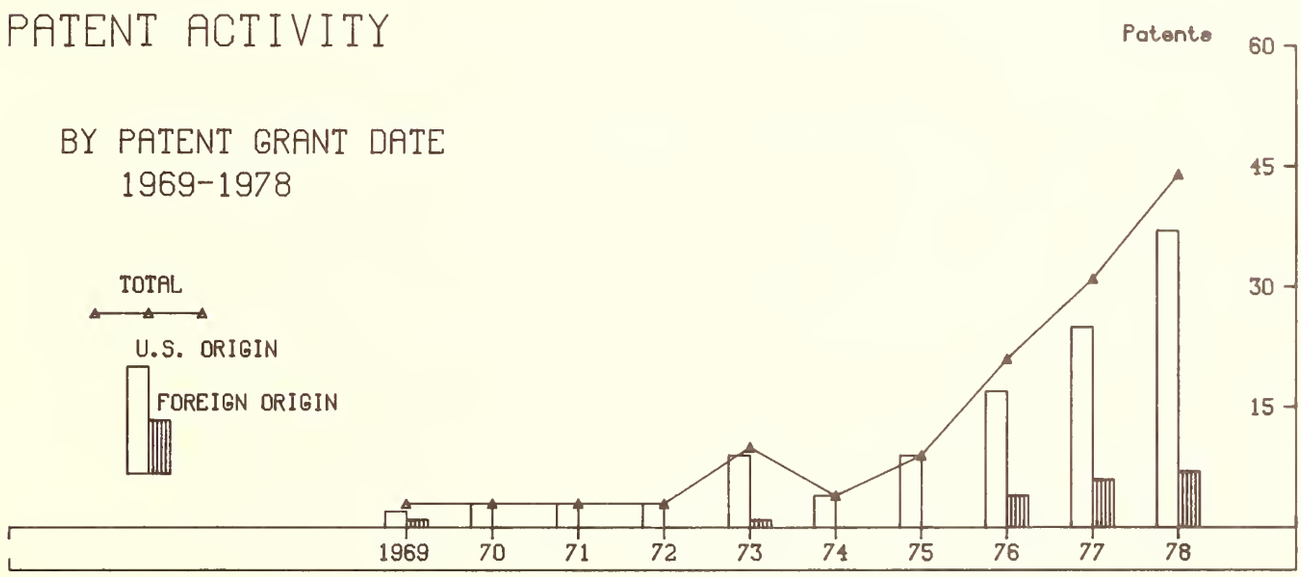
GROWTH	73.3%
FOREIGN SHARE	17.7%
CORPORATE OWNED	17.7%
GOVERNMENT OWNED	0.0%
U.S. OWNED OF FOREIGN	0.0%

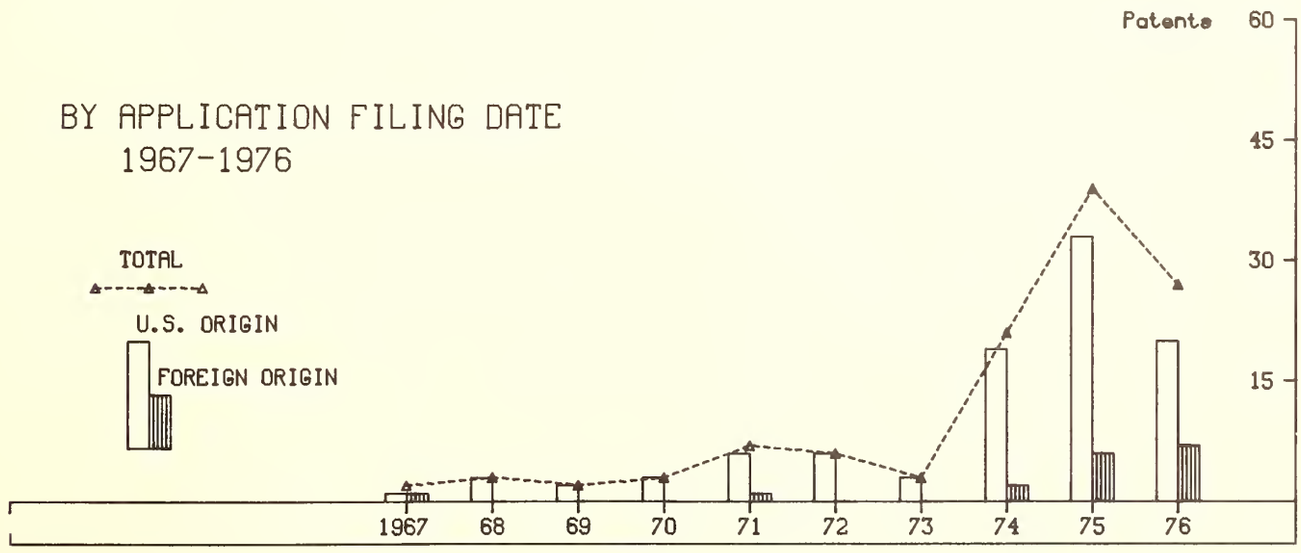
INCLUDED IN THIS PROFILE ARE ALL OF THE PATENTS FROM:

Class 290, Subclasses 44,45

AND SELECTED PATENTS FROM:

Class 60, Subclasses 398,641,698
Class 244, Subclass 58
Class 322, Subclasses 2R, 2A
Class 415, Subclasses 2-5, 7,8
Class 416, Subclasses 37, 41, 85, DIG 4
Class 417, Subclass 334





SOLAR ENERGY - ELECTRICITY GENERATED BY WIND

PATENT ACTIVITY (1963-1978) BY DATE OF PATENT GRANT

	NUMBER OF PATENTS															
	63-64	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	TOTAL
TOTAL	1	1	3	2		3	3	3	3	10	4	9	21	31	44	138
U.S. ORIGIN			1	2		2	3	3	3	9	4	9	17	25	37	115
FOREIGN ORIGIN	1	1	2			1				1			4	6	7	23
GERMANY			2			1							1		3	7
CANADA		1								1			2	1	2	7
UNITED KINGDOM	1													1	1	3
FRANCE														2		2
NETHERLANDS														1		1
ISRAEL															1	1
JAPAN													1			1
WEST INDIES														1		1
U.S. ORIGIN			1	2		2	3	3	3	9	4	9	17	25	37	115
U.S. CORP. OWNED				1					1	2		3	1	2	9	19
U.S. GOVT. OWNED						1										1
U.S. INDIV. OWNED			1	1		1	3	3	2	7	4	6	16	23	28	95
FOREIGN OWNED																
FOREIGN ORIGIN	1	1	2			1				1			4	6	7	23
U.S. OWNED																
FOREIGN OWNED	1	1	2			1				1			4	6	7	23
FOREIGN CORP.	1					1							1	1	3	7
FOREIGN GOVT.																
FOREIGN INDIV.		1	2							1			3	5	4	16

SOLAR ENERGY - ELECTRICITY GENERATED BY WIND

PATENT ACTIVITY (PATENTS GRANTED 1/67-12/78) BY DATE OF PATENT APPLICATION

	NUMBER OF PATENTED APPLICATIONS															
	PRE 65	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	TOTAL
TOTAL	1	1	2	2	3	2	3	7	6	3	21	39	27	16		133
U.S. ORIGIN	1	1	2	1	3	2	3	6	6	3	19	33	20	14		114
FOREIGN ORIGIN				1				1			2	6	7	2		19
GERMANY				1								3	1			5
CANADA								1			1	2	1	1		6
UNITED KINGDOM													2			2
FRANCE													2			2
NETHERLANDS												1				1
ISRAEL														1		1
JAPAN											1					1
WEST INDIES													1			1
U.S. ORIGIN	1	1	2	1	3	2	3	6	6	3	19	33	20	14		114
U.S. CORP. OWNED		1					1		3	1	3	6	1	3		19
U.S. GOVT. OWNED			1													1
U.S. INDIV. OWNED	1		1	1	3	2	2	6	3	2	16	27	19	11		94
FOREIGN OWNED																
FOREIGN ORIGIN				1				1			2	6	7	2		19
U.S. OWNED																
FOREIGN OWNED				1				1			2	6	7	2		19
FOREIGN CORP.				1								2	3			6
FOREIGN GOVT.																
FOREIGN INDIV.								1			2	4	4	2		13

ELECTRICITY GENERATED BY WIND

ASSIGNEES WITH 1 OR MORE PATENTS (1/69 -12/78)

GRUMMAN AEROSPACE CORPORATION	2
BAUMGARTNER, FRANKLIN W.	1
ADAMS, BEATRICE N.	1
BROWNE ENGINEERING CORPORATION	1
B.V. VURO VORR WETENSCHAPPELIJKE EN TECNISCHE ONTWERPEN WTO	1
CANADIAN PATENTS + DEVELOPMENT LIMITED	1
CLC CORPORATION	1
DAIMLER-BENZ AKTIENGESELLSCHAFT	1
KIELEY + MUELLER, INC.	1
GLICK, LOUIS MICHAEL	1
LASER VIDEO, INC.	1
MATER, MILTON H.	1
K.M.P. LAKE PUMP MFG. CO.	1
NATIONAL RESEARCH DEVELOPMENT CORPORATION	1
NATURAL ENERGY SYSTEMS, INC.	1
MEGATECH CORPORATION	1
RAYMOND LEE ORGANIZATION, INC.	1
RCH ENERGY CORPORATION	1
POLYTECHNIC INSTITUTE OF NEW YORK	1
STICHTING ENERGIEONDERZOEK CENTRUM NEDERLAND	1
TIPPS, THOMAS R.	1
SMITH, HERMAN P.	1
UNEP ENERGY SYSTEMS INC.	1
UNITED STATES OF AMERICA, NAVY	1
TURBOMACHINES, INC.	1
WIND POWER SYSTEMS, INC.	1
WINDSUNWATT, INC.	1
VARTA BATTERIE AKTIENGESELLSCHAFT	1
ZEPHYR WIND DYNAMO COMPANY	1

ASSIGNEO PATENTING(1/69 - 12/78) - - ALPHA LISTING

AOAMS, BEATRICE N.
3740565 - AIR ORIVEN MOOULAR TANOEUM ELECTRICAL GENERATOR

BAUMGARTNER; FRANKLIN W.
4012163 - WINO ORIVEN POWER GENERATOR

BROWNE ENGINEERING CORPORATION
3952723 - WINDMILLS

B.V. VURO VORR WETENSCHAPPELIJKE EN TECHISCHE ONTWERPEN WTO
4032257 - MILL, PARTICULARLY WINOMILL

CANADIAN PATENTS + OEVELOPMENT LIMITEO
4082479 - OVERSPEEO SPOILERS FOR VERTICAL AXIS WINO TURBINE

CLC CORPORATION
3878913 - GENERATING SYSTEM FOR AN ELECTRIC VEHICLE

OAIMLER-BENZ AKTIENGESELLSCHAFT
3992885 - ORIVE ARRANGEMENT FOR THE AUXILIARY AGGREGATES OF A MOTOR VEHICLE

GLICK; LOUIS MICHAEL
4095120 - LOAO CONTROL FOR WINO-DRIVEN ELECTRIC GENERATORS

GRUMMAN AEROSPACE CORPORATION
4070131 - TORNAOO-TYPE WINO TURBINE
4075500 - VARIABLE STATOR, OIFFUSER AUGMENTEO WIND TURBINE ELECTRICAL GENERATION SYSTEM

KIELEY + MUELLER, INC.
3776279 - SYSTEM FOR CHANGING FLUID MOVEMENT INTO ELECTRICAL ENERGY

K.M.P. LAKE PUMP MFG. CO.
3667861 - WINO VANE CONTROLLING OIRECTION ANO BRAKE MEANS

LASER VIOEO, INC.
4084182 - MULTI-BEAM MODULATOR ANO METHOD FOR LIGHT BEAM OISPLAYS

MATER; MILTON H.
4039849 - WINO POWERED GENERATING SYSTEMS

MEGATECH CORPORATION
4087927 - WINO POWER OEMONSTRATION APPARATUS

NATIONAL RESEARCH OEVELOPMENT CORPORATION
4087202 - VERTICAL AXIS WINO TURBINES

NATURAL ENERGY SYSTEMS, INC.
3883750 - METHOD AND APPARATUS FOR GENERATING POWER FROM WINO CURRENTS

POLYTECHNIC INSTITUTE OF NEW YORK
4105362 - OOUBLE VORTEX AUGMENTOR WIND CONVERSION SYSTEM

ASSIGNEO PATENTING(1/69 - 12/78) - - ALPHA LISTING

RAYMOND LEE ORGANIZATION, INC.
4018543 - WHIRLWINO POWER SYSTEM

RCH ENERGY CORPORATION
3895236 - ENERGY CONVERSION APPARATUS

SMITH, HERMAN P.
3846042 - PEOESTAL MOUNTEO WINO GENERATOR

STICHTING ENERGIEONOERZOEK CENTRUM NEDERLANO
4112311 - WINOMILL PLANT FOR GENERATING ENERGY

TIPPS; THOMAS R.
4127356 - WINO MOTOR MACHINE

TURBOMACHINES, INC.
4084918 - WIND MOTOR ROTOR HAVING SUBSTANTIALLY CONSTANT PRESSURE ANO RELATIVE VELOCITY FOR AIRFLOW THERETHROUGH

UNEP ENERGY SYSTEMS INC.
4118637 - INTEGRATEO ENERGY SYSTEM

UNITEO STATES OF AMERICA, NAVY
3473038 - WINO ORIVEN GENERATOR

VARTA BATTERIE AKTIENGESELLSCHAFT
3484617 - ELECTRICAL POWER SYSTEM FOR A LOAO IN A REMOTE AREA

WINO POWER SYSTEMS, INC.
4110631 - WINO-ORIVEN GENERATOR

WINOSUNWATT, INC.
4047834 - HORIZONTAL MULTIOIRECTIONAL TURBINE WINOMILL

ZEPHYR WINO OYNAMO COMPANY
4087990 - TRANSMITTING TORQUE

UNASSIGNED PATENTS (1/75-12-78) INVENTORS (ALPHA LISTING)

INVENTOR NAME			STREET	CITY	ST	ZIP/CNTRY
ANTOGINI	ENRICO		WIREGRASS FARM, R.R. NO. 3	PICTON, ONTARIO		CA
3976396 - DEVICE FOR CONVERTING FLUID FLOW INTO KINETIC ENERGY						
ASPERGER	PAUL		4225 CHERYL DRIVE	FLINT	MI	48506
4031405 - WINDMILL WITH SHROUD ADJUSTING MEANS						
BAILEY	WAYNE		BOX 89	JOHNSONVILLE	NY	12154
3974394 - CAPTURING HYDRO POWER, EARTH POWER AND WIND POWER WITH MEANS AND METHODS OF STORING SAME						
BARDEKOFF	ABRAHAM		2965 MARION AVE.	BRONX	NY	10458
4068132 - WIND POWERED ELECTRICAL GENERATING PLANT						
BEA	KARL	J.	128 DEWITT ST.	SYRACUSE	NY	13203
4008006 - WIND POWERED FLUID COMPRESSOR						
BOLIE	VICTOR	W.	7504 AMERICAN HERITAGE NE.	ALBUQUERQUE	NM	87109
4116581 - SEVERE CLIMATE WINDMILL						
BOURQUARDEZ	GASTON		VALLON DES LAURIERS	AIX-EN-PROVENCE		FR
4050246 - WIND DRIVEN POWER SYSTEM						
BRIGHT	CLARK		151 MAKAI PLACE	KULA KAI, MAUI	HI	96790
3974395 - POWER GENERATING APPARATUS						
BUNZER	GEORGE	J.	54 CROWN POINT	NOKOMIS	FL	33555
4019828 - WIND DRIVEN APPARATUS						
BURNETT	JAMES	T.	RIVER BANK ROAD	BATESVILLE	AR	72501
4031702 - MEANS FOR ACTIVATING HYDRAULIC MOTORS						
BUTLER	TONY	W. JR.	3224 TIMMONS LANE, NO. 136	HOUSTON	TX	77027
4004427 - ENERGY CONVERSION SYSTEM						
CARTER	FRANK	H.	428 NORTH ST.	TAFT	CA	93268
3942026 - WIND TURBINE WITH GOVERNOR						
3944839 - MULTI-WINDMILL WHEEL POWER GENERATOR						
COHEN	NATHAN		19 OLIVE	GREAT NECK	NY	11022
4079264 - WIND OR WATER OPERATED POWER PLANT						
DECKER	BERT	J.	136 CAPEN BLVD.	BUFFALO	NY	14226
3920354 - HORIZONTAL HINGED-FLAP WINDMILL						
4047833 - HORIZONTAL WINDMILL						
DIGGS	RICHARD	E.	P.O. BOX 776	CARTHAGE	MO	64836
4035658 - HIGH POWER WIND TURBINE WITH KINETIC ACCUMULATOR						
DRUCKER	ERNEST	R.	86 SAGINAW CRESCENT	OTTAWA		CA
3979597 - SOLAR POWER PLANT						
ELLIS	GAYLORD	O.	61 BELLARMINE DRIVE	ROCHESTER	MI	48063
4021135 - WIND TURBINE						

UNASSIGNEO PATENTS (1/75-12-78) INVENTORS (ALPHA LISTING)

INVENTOR NAME				STREET	CITY	ST	ZIP/CNTRY
FIELDS	JOE	C.	JR.	16023 DEBBIE LANE	CHANNELVIEW	TX	77530
3956902 - HEATING ANO COOLING SYSTEM							
FLETCHER	ORVAL	K.		RTE. 2	BRUCE	WI	54819
4093035 - FLUIO MILL POWERED VEHICLE							
FRY	CHARLES	MAX		17144 E. BROWN CIR.	AURORA	CO	80013
4084102 - WINO ORIVEN, HIGH ALTITUOE POWER APPARATUS							
GAY	DAVIO			C/O MR. W. S. LEWIS, 80, CHURC	SALE, CHESHIRE M33 5		EN
4018051 - OMNIDIRECTIONAL AIR ORIVEN POWER GENERATING SYSTEM							
GERMAIN	FERNANO			BOIS-THIBAULT-BALATA	97200 FORT OE FRANCE		WI
4058979 - ENERGY STORAGE AND CONVERSION TECHNIQUE ANO APPARATUS							
GRAYBILL	CLINTON	L.		P.O. BOX 396	SUPERIOR	MT	59872
3995170 - WINO ENERGY CONVERSION OEVICE							
GROSSMAN	WILLIAM	C.		4274 BRIARWOOO WAY	PALO ALTO	CA	94303
4055950 - ENERGY CONVERSION SYSTEM USING WINOMILL							
GROTBERG	ROBERT	B.			KATHRYN	NO	58089
4101244 - VERTICAL AXLE PAOOLE MOTOR							
HEILEMANN	VOLKMAR			127 MOUNTAINVIEW ROAO	WARREN TOWNSHIP	NJ	07060
3990245 - ENERGY CONVERTER DEVICE							
HENORIX	ARNOLO	P.		RTE. 1, BOX 775	ATOKA	TN	38004
4031702 - MEANS FOR ACTIVATING HYORAULIC MOTORS							
HERBERG	GEORGE	M.			GONVICK	MN	56644
3996741 - ENERGY STORAGE SYSTEM							
HILLMAN	EOWIN	K.		907 W. OESERT COVE	PHOENIX	AZ	85029
3899268 - WIND-ORIVEN MOTIVE APPARATUS							
HINTZE	ANTON	E.		103 MARGARET LA.	GRASS VALLEY	CA	95945
4115028 - WIND POWERED CYLINOER							
HISE	HENRY	W.		2209 HANCOCK OR.	AUSTIN	TX	78756
4084102 - WIND ORIVEN, HIGH ALTITUOE POWER APPARATUS							
HOPE	HENRY	F.		2421 WYANDOTTE RO.	WILLOW GROVE	PA	19090
4088419 - WIND OPERATEO POWER PLANT							
HORVAT	GEORGE	T.		1319 S. 102NO ST.	WEST ALLIS	WI	53214
4002218 - ELECTRICAL VEHICLE							
HUDSON	GERALO	E.		229 15TH ST. WEST	BILLINGS	MT	59102
4074951 - WINO POWER CONVERTER							
JACOBS	MARCELLUS	L.		RTE. 11, BOX 722	FORT MYERS	FL	33901
4059771 - WINO ELECTRIC PLANT WITH IMPROVEO ALTERNATOR FIELO EXCITATION							

UNASSIGNED PATENTS (1/75-12-78) INVENTORS (ALPHA LISTING)

INVENTOR NAME			STREET	CITY	ST	ZIP/CNTRY
JACOBS	MARCELLUS	L.	RTE. 13, BOX 722	FORT MYERS	FL	33901
4068131 - WIND ELECTRIC PLANT						
JACOBS	PAUL	R.	RTE. 11, BOX 722	FORT MYERS	FL	33901
4059771 - WIND ELECTRIC PLANT WITH IMPROVED ALTERNATOR FIELD EXCITATION						
JACOBS	PAUL	R.	RTE. 13, BOX 722	FORT MYERS	FL	33901
4068131 - WIND ELECTRIC PLANT						
KELLEY	LAWRENCE	L.	526 LINCOLN AVE.	TITUSVILLE	FL	32780
4118144 - SUPPORT MEANS FOR A WINDMILL						
KELLY	DONALD	A.	58-06 69TH PL.	MASPETH, NEW YORK	NY	11378
4119863 - COMBINED HIGH DENSITY SOLAR PANELS AND VERTICAL WIND TURBINES						
KENNEY	CLARENCE	E.	119 STUART ROAD	RACINE	WI	53406
4029434 - VARIABLE PITCH MOUNTING FOR AIRFOIL BLADES OF A WINDMILL OR PROPELLER						
KLING	ALBERTO		AM HUGEL 14	D-8136 PERCHA		DT
4073516 - WIND DRIVEN POWER PLANT						
KLING	ALBERTO		AM HUGEL 14	8136 PERCHA		DT
4088352 - WIND-DRIVEN POWER PLANT						
KRONMILLER	GEORGE	JOHN	433 MILLBROOK AVE.	RANDOLPH	NJ	07801
4087196 - APPARATUS FOR DERIVING ENERGY FROM MOVING GAS STREAMS						
LEBOST	BARRY	ALAN	3224 GRAND CONCOURSE	BRONX	NY	10468
4057270 - FLUID TURBINE						
LEVINE	STEVEN	K.	713 WASHINGTON ST.	NEW YORK	NY	10014
3936652 - POWER SYSTEM						
LOEB	ARNOLD		2956 W. LUNT AVE.	CHICAGO	IL	60645
4124182 - WIND DRIVEN ENERGY SYSTEM						
LOIS	LAMBROS		4857 BATTERY LANE, APT. 406	BETHESDA	MD	20014
3924827 - APPARATUS FOR EXTRACTING ENERGY FROM WINDS AT SIGNIFICANT HEIGHT ABOVE THE SURFACE						
LOIS	LAMBROS		6104 DUNLEER COURT	BETHESDA	MD	20034
4076190 - APPARATUS FOR EXTRACTING ENERGY FROM WINDS AT SIGNIFICANT HEIGHT ABOVE THE SURFACE						
LOTH	JOHN	LODEWYK	P.O. BOX 4094	MORGANTOWN	WV	26505
4105363 - OVERSPEED CONTROL ARRANGEMENT FOR VERTICAL AXIS WIND TURBINES						
MARACIC	MIRKO		25-75 45TH ST.	ASTORIA	NY	11103
4116585 - SELF-ADJUSTING WIND MACHINE						
MCCUTCHEN	CHARLES		5213 ACACIA AVE.	BETHESDA	MD	20014
3987987 - SELF-ERECTING WINDMILL						
MILLER	DENVER	W.	10208 SE. TELFORD ROAD	BORING	OR	97009
3957390 - WIND DRIVEN POWER MECHANISM						

UNASSIGNEO PATENTS (1/75-12-78) INVENTORS (ALPHA LISTING)

INVENTOR NAME			STREET	CITY	ST	ZIP/CNTRY
MILLER	OENVER	W.	10208 SE. TILFORO RO.	BORING	OR	97009
4093398 - WINO ORIVEN POWER MECHANISM						
MOYER	ROBERT	O.	C/O B. [J. OISTRIBUTORS, R.R.	STAR CITY	IN	46985
3895882 - WINDMILL STRUCTURE						
OLSON	LEONARO		107 W. CHEYENNE RO.	COLORAOO SPRINGS	CO	80906
4125343 - PLANETARY BLAOE TURBINE						
PALMA	FLORENCIO	N.	263 KEELE ST.	TORONTO		CA
4129787 - OOUBLE WINO TURBINE WITH FOUR FUNCTION BLAOE SET						
PAYNE	PETER	R.	RTE. 5 BOX 282	ANNAPOLIS	MD	21401
3987987 - SELF-ERECTING WINDMILL						
PAYNE	PETER	R.	RTE. 5, BOX 282	ANNAPOLIS	MO	21401
4024409 - AEOLIAN WINOMILL						
PEOERSEN	NICHOLAS	F.	3199 STURBRIOGE	FARMINGTON	MI	48024
4021135 - WINO TURBINE						
PEEO	PAUL	V.	1053 NORTH AVE.	SACRAMENTO	CA	95838
4061926 - WINO ORIVEN ELECTRICAL GENERATOR						
PLEN	ABRAHAM		12 USSISHKIN ST.	TEL AVIV		IL
4109465 - WINO ENERGY ACCUMULATOR						
QUINN	PAUL	J.	633 S.W. 5TH ST.	BOCA RATON	FL	33432
3902072 - WINO TURBINE						
RI	ZAISUI		4-4, TAKAMATSUCHO	TAKARAZUKA		JA
3942025 - PROCESS FOR STORING ELECTRICITY FOR A FAST AOVANCING CONVEYANCE ANO OEVICE FOR STORING SUCH ELECTRICITY						
RICHARD	JOSEPH	G.	357 SOUTH ST.	HYANNIS	MA	02601
4111601 - AOJUSTABLE WINOMILL						
SARCHET	OOUGLAS	P.	APT. 6C, 143-06 BARCLAY AVE.	FLUSHING	NY	11355
4066911 - WINO-DRIVEN PRIME MOVER						
SCHERER	PETER		554 HARGRAVE AVE.	INGLEWOOO	CA	90302
4006925 - WINO POWER ENERGY GENERATING SYSTEM						
SCHNEIOER	OANIEL	J.	608 DURANGO CIRCLE SOUTH	IRVING	TX	75062
4049300 - FLUIO ORIVEN POWER PROOUCING APPARATUS						
SELLMAN	DONALO	L.	407 S. 3RO ST.	LINCOLN	KS	67455
3986786 - WINO MOTORS						
3988072 - WINO MOTORS						
SFORZA	PASQUALE	M.	42 MECHANIC ST.	HUNTINGTON	NY	11743
4111594 - FLUID FLOW ENERGY CONVERSION SYSTEMS						

UNASSIGNEO PATENTS (1/75-12-78) INVENTORS (ALPHA LISTING)

INVENTOR NAME			STREET	CITY	ST	ZIP/CNTRY
SICARO	CHARLES	ANORE	29 RUE OIERVILLE	6211 BUCQUOY		FR
4048947 - ROTARY OEVICE ORIVEN BY A MOVING FLUIO						
SOULES	CHARL		37 KINGSOALE AVE.	WILLOWDALE, ONTARIO		CA
4004861 - WINO ORIVEN PRIME MOVER						
STOECKERT	CHRISTIAN		P.O. BOX 993	JETERSVILLE	VA	23083
3876925 - WINO TURBINE ORIVEN GENERATOR TO RECHARGE BATTERIES IN ELECTRIC VEHICLES						
SZOEKE	JOSEPH		57 PORTLANO PL.	YONKERS	NY	10703
4086498 - WIND POWEREO ROTARY ELECTRIC GENERATOR						
THOMAS	ROBERT	NASON	8O LINCOLN OR.	VENTURA	CA	93003
4115027 - VERTICAL WINOMILL						
TROLL	JOHN	H.	CEOAR ROAO EAST	KATONAH	NY	10536
3944840 - WINO POWER CONVERSION SYSTEM						
WEISBRICH	ALFREO	L.	86 HIGH PATH ORIVE	WINOSOR	CT	06095
4021140 - VARIABLE GEOMETRY WINDTURBINE						
WENDLER	CLARENCE		244 N. FOURTH	DIGHTON	KS	67839
3957397 - CONVERSION OF WINO ENERGY TO MECHANICAL ENERGY						
WILKERSON	ALAN	W.	41O MAOERO ORIVE	THIENSVILLE	WI	53092
3946242 - GEOPHYSICAL ENERGY SOURCE UTILIZATION CIRCUIT						
WINOERL	W1LLIAM	R.	124 1ST N.	GLASGOW	MT	59230
4039848 - WINO OPERATED GENERATOR						
YOUSEF	HOSNI	LABIB	WILLIS AVE.	MUTTONTOWN	NY	
4114046 - ELECTRICAL GENERATOR EMPLOYING NATURAL ENERGY TO POWER SAME						

PATENTS (1/63-12/78) WITH NEITHER ASSIGNMENT NOR INVENTOR INFORMATION IN OATABASE

3426214 - ELECTRIC POWER GENERATING SYSTEM
3513326 - WINO MOTOR WHEEL
3523192 - METHOO ANO APPARATUS FOR INCREASING THE EFFICIENCY OF ELECTRIC GENERATION
3538340 - METHOD ANO APPARATUS FOR GENERATING POWER
3556239 - ELECTRICALLY DRIVEN VEHICLE
3565546 - WINO MOTOR
3621930 - SYSTEM OF ELECTRICITY GENERATION FOR MOTOR ORIVEN VEHICLES
3671756 - ELECTRICAL POWER GENERATOR
3697765 - FLUIO ORIVEN ELECTRICAL POWER APPARATUS
3707812 - OWELLING
3713503 - VEHICLE GENERATOR SYSTEM
3720840 - WINO TURBINE GENERATOR WITH EXHAUST GAS HEATER
3721290 - TOWER WITH ROTATEO COOLING ASSEMBLY
3730643 - WIND POWER MACHINE
3743848 - WINO ORIVEN POWER PROOUCING APPARATUS

PATENTS (1/63-12/78) WITH NEITHER ASSIGNMENT NOR INVENTOR INFORMATION IN DATABASE

3752395 - WIND MOTOR OPERATED HEATING SYSTEM
3757730 - WIND ACTUATED DEVICES
3793530 - WIND TURBINE GENERATOR
3806733 - WIND OPERATED POWER GENERATING APPARATUS
3810712 - WIND POWERED MOTIVE APPARATUS
4003676 - WINDMILL BLADE AND PROCESSES RELATED THERETO
4031173 - EFFICIENCY AND UTILIZATION OF COOLING TOWERS
4075545 - CHARGING SYSTEM FOR AUTOMOBILE BATTERIES
3149678 3222533 3228475 3238911 3269121 3315085 3339078

ELECTRICITY GENERATED BY WIND

PATENTING UPDATE (1/79-10/79)

Patent No.	Assignee & Title
4,132,499	Ben Gurion University: Wind Driven Energy Generating Device
4,134,707	Marion H. Ewers, P.O. Box 526, La Veta, CO 81055: Wind Turbine Apparatus
4,134,708	Bradley O. Brauser, 1512 Nicklas, Oklahoma City, OK 73127, and Stanley O. Brauser, 511 Ranchwood, Yukon, OK 73099: Wind Driven Electric Power Plant
4,137,009	Board of Regents University of Nevada System: Pivoted Blade Barrel Rotor Wind Turbine
4,140,433	Oliver C. Eckel, 75 Grove St., Wellesley, MASS 02181: Wind Turbine
4,141,215	Concepcion Cadalzo, 80 Van Wagenen Ave., Jersey City, NJ 07306: Windmill Mechanism
4,142,822	Frank P. Herbert 2145 Ivy St., Port Townsend, Wash 98366 and John Ottenheimer, P.O. Box 1378, Lopex Island, Wash 98261: Panemone Windmill
4,142,830	Walter Schonball, Thuringerstrasse 6, D-53 Bonn, Fed. Rep. of Germany: Mechanical Overload System For Wind Generators
4,143,522	World Energy Systems: Windmill Operated System
4,143,992	Charles W. Crook, Rte. 1, Box 35, Earle, AK 72331: Wind Operated Power Generator
4,146,264	Louis Michael Glick: Load Control For Wind-Driven Electric Generators
4,146,800	Stephen E. Gregory, 1605 N. State St. and Alma K. Schurig, 231 E. 700 N. Both of Orem, Utah 84057: Apparatus And Method Of Generating Electricity From Wind Energy
4,148,192	Troy A. Cummings, 912 Margate Ter., Chicago, ILL 60640: Internal Combustion Electric Power Hybrid Power Plant
4,149,092	Spie-Batignolles & Societe Generale de Techniques et d'Estudes, both of Puteaux, France: System For Converting The Randomly Variable Energy Of A Natural Fluid

4,150,300 Martin Van Winkle, R.F.D. No. 1, Ashland, NH 03217: Electrical And Thermal Energy Supply System For Buildings

4,150,301 Karl H. Bergey, Jr., Rt. 1 Box 151-B, Norman, OK 73069: Wind Turbine

4,150,923 John C. Wardman, 1060 San Tomas Aquino Rd., Campbell, CA 95008: Reciprocating Pump Powered By Solar And Wind Energy

4,154,556 George W. Webster, 110 Crow Rd., Glasgow, Scotland: Devices For Utilizing The Power Of The Wind

4,159,191 Clinton L. Graybill, P.O. Box 396, Superior, Mont. 59872: Fluid Rotor

4,159,426 Ronald R. Staton, R.D. No. 1, Box 298, Barto, PA 19504: Energy Conversion System

4,160,170 United Technologies Corporation: Wind Turbine Generator Pitch Control System

4,161,658 United Technologies Corporation: Wind Turbine Generator Having Integrator Tracking

4,162,410 James L. Amick, 1464 Cedar Bend Dr., Ann Arbor, Mi 48105: Vertical-Axis Windmill

4,164,382 General Atomic Company: Wind Driven Power Apparatus

4,166,222 John Hanley, P.O. Box 1423, Conrad, Mont. 59425: Wind Wheel Apparatus For Use With A Hydro-Electric Dam

4,166,596 William J. Mouton, Jr., Box 10515, New Orleans, LA 70181 & David F. Thompson, 2540 Green St., Chester, PA 19013: Airship Power Turbine

4,167,372 Unep 3 Energy Systems, Inc.: Integrated Energy System

4,168,439 F. Neto Palma, 263 Keele St., Toronto, Canada: Wind Turbine

4,171,491 Stichting Energieonderzoek Centrum Nederland, The Hague, Netherlands: Plant For Generating And Accumulating Electric Energy With The Aid Of Wind Power or Solar Energy

TIDE AND WAVE ENERGY USE

This profile includes systems which utilize the energy of tidal or wave motion in large unconfined bodies of water, relying almost exclusively on the periodic vertical component of the fluid motion to do the work. These systems operate by converting the relatively rapid periodic rise and fall of the water into reciprocating mechanical motion by means of a buoyant member. This mechanical motion is then utilized to perform the desired task. Not included are systems which artificially confine bodies of water, such as tidal-storage type hydroelectric systems.

INCLUDED IN THIS PROFILE ARE ALL OF THE PATENTS FROM:

Class 60, Subclasses 495-507
Class 290, Subclasses 42,53
Class 417, Subclasses 330-333

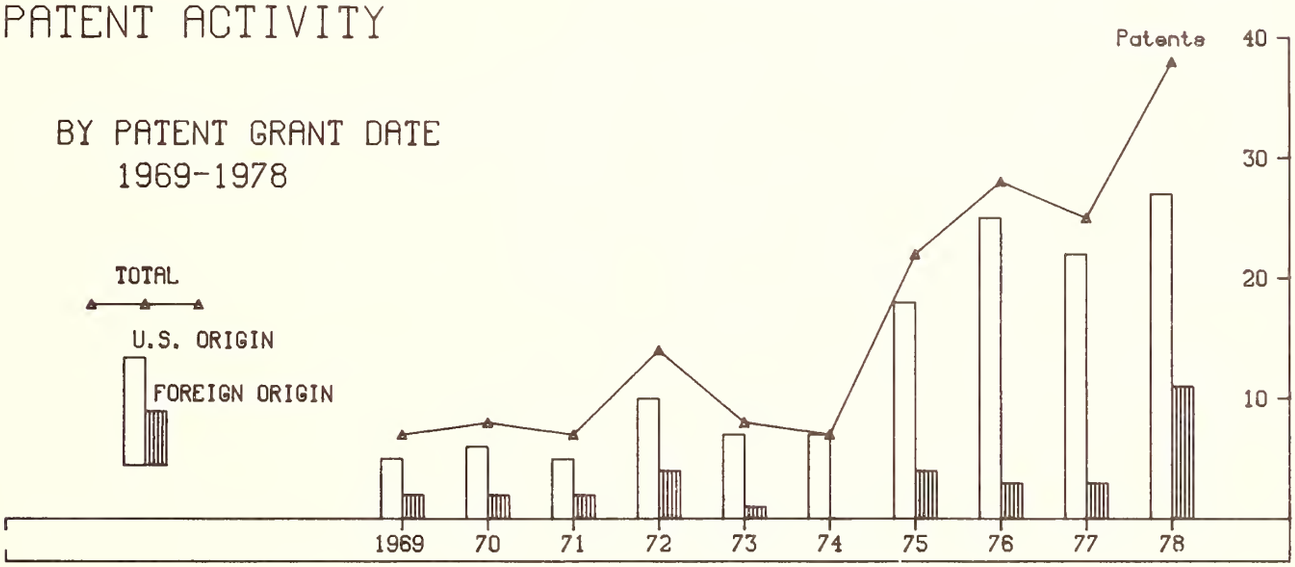
AND SELECTED PATENTS FROM:

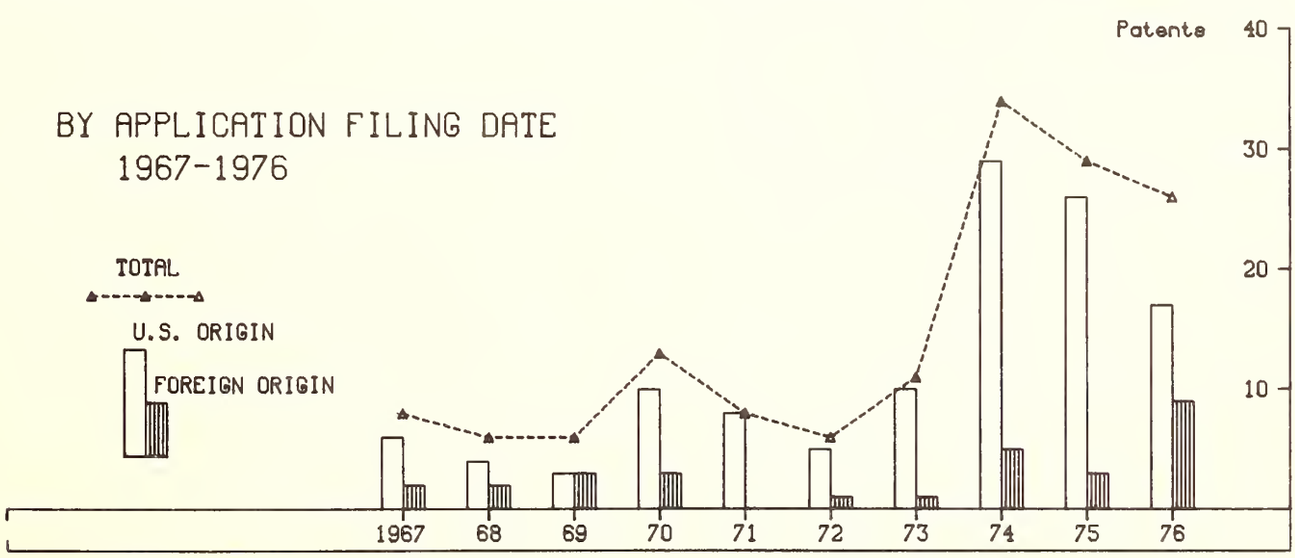
Class 60, Subclass 398
Class 415, Subclasses 2-5, 7,8
Class 416, Subclass 85
Class 417, Subclasses 53,334,379

ACTIVITY INDICES (1976-1978)

GROWTH	55.5%
FOREIGN SHARE	18.7%
CORPORATE OWNED	12.1%
GOVERNMENT OWNED	0.0%
U.S. OWNED OF FOREIGN	0.0%

PATENT ACTIVITY





SOLAR ENERGY - TIDE AND WAVE ENERGY USE

PATENT ACTIVITY (1963-1978) BY DATE OF PATENT GRANT

	NUMBER OF PATENTS															
	63-64	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	TOTAL
TOTAL	13	12	16	11	9	7	8	7	14	8	7	22	28	25	38	225
U.S. ORIGIN	11	7	12	9	5	5	6	5	10	7	7	18	25	22	27	176
FOREIGN ORIGIN	2	5	4	2	4	2	2	2	4	1		4	3	3	11	49
UNITED KINGDOM	1		2						1	1		1	1	1	2	10
JAPAN		2		1								1		1	2	7
SWITZERLAND		1			2		2									5
GERMANY		1		1	1	1										4
CANADA		1						1	1			1				4
SWEDEN								1					1		1	3
ARGENTINA															2	2
MEXICO			2													2
U.S.S.R.									1			1				2
AUSTRALIA	1															1
FINLAND														1		1
FRANCE									1							1
CHINA(TAIWAN)													1			1
PHILIPPINES															1	1
COSTA RICA															1	1
DOMINICAN REP.															1	1
NEW ZEALAND						1										1
ISRAEL															1	1
HUNGARY					1											1
U.S. ORIGIN	11	7	12	9	5	5	6	5	10	7	7	18	25	22	27	176
U.S. CORP. OWNED	6	4	6	6		1	3	1	2	1	3		5	1	1	40
U.S. GOVT. OWNED								2	1							3
U.S. INDIV. OWNED	5	3	6	3	5	4	3	2	7	6	4	18	20	21	26	133
FOREIGN OWNED																
FOREIGN ORIGIN	2	5	4	2	4	2	2	2	4	1		4	3	3	11	49
U.S. OWNED					1				1							2
FOREIGN OWNED	2	5	4	2	3	2	2	2	3	1		4	3	3	11	47
FOREIGN CORP.	1	3	1	2	3	2	2							1	3	18
FOREIGN GOVT.																
FOREIGN INDIV.	1	2	3					2	3	1		4	3	2	8	29

SOLAR ENERGY - TIDE AND WAVE ENERGY USE

PATENT ACTIVITY (PATENTS GRANTED 1/67-12/78) BY DATE OF PATENT APPLICATION

	NUMBER OF PATENTED APPLICATIONS															
	PRE 65	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	TOTAL
TOTAL	2	8	9	8	6	6	13	8	6	11	34	29	26	18		184
U.S. ORIGIN	1	7	5	6	4	3	10	8	5	10	29	26	17	15		146
FOREIGN ORIGIN	1	1	4	2	2	3	3		1	1	5	3	9	3		38
UNITED KINGDOM							1		1		1	1	2	1		7
JAPAN	1									1			2	1		5
SWITZERLAND			2		2											4
GERMANY		1	1	1												3
CANADA						1	1				1					3
SWEDEN						1					1	1				3
ARGENTINA													2			2
MEXICO																
U.S.S.R.							1				1					2
AUSTRALIA																
FINLAND													1			1
FRANCE						1										1
CHINA(TAIWAN)											1					1
PHILIPPINES												1				1
COSTA RICA														1		1
DOMINICAN REP.													1			1
NEW ZEALAND				1												1
ISRAEL													1			1
HUNGARY			1													1
U.S. ORIGIN	1	7	5	6	4	3	10	8	5	10	29	26	17	15		146
U.S. CORP. OWNED		5	2	1	2	1		3		3	1	5	1			24
U.S. GOVT. OWNED							2	1								3
U.S. INDIV. OWNED	1	2	3	5	2	2	8	4	5	7	28	21	16	15		119
FOREIGN OWNED																
FOREIGN ORIGIN	1	1	4	2	2	3	3		1	1	5	3	9	3		38
U.S. OWNED			1			1										2
FOREIGN OWNED	1	1	3	2	2	2	3		1	1	5	3	9	3		36
FOREIGN CORP.	1	1	3	2	2								2	2		13
FOREIGN GOVT.																
FOREIGN INDIV.						2	3		1	1	5	3	7	1		23

TIDE AND WAVE ENERGY USE

ASSIGNEES WITH 1 OR MORE PATENTS (1/69 - 12/79)

THERMO ELECTRON CORPORATION	2
UNITED STATES OF AMERICA, NAVY	2
LAITRAM CORPORATION	2
SULZER BROTHERS LIMITED	2
WESTINGHOUSE ELECTRIC CORP.	2
AMERICAN AIR FILTER COMPANY, INC.	1
AQUALECTRA	1
AQUATECH CO., LTD.	1
COOPER, GEORGE F.	1
FOSTER WHEELER CORPORATION	1
INSITUFORM (PIPES + STRUCTURES) LTD.	1
INTERNATIONAL TELEPHONE AND TELEGRAPH CORPORATION	1
ALLIS-CHALMERS CORPORATION	1
L. C. STEINMULLER GMBH	1
LUCAS INDUSTRIES LIMITED	1
MARTIN + BOTTING DEVELOPMENTS LIMITED	1
OCEAN POWER GENERATION, INC.	1
OMARK INDUSTRIES, INC.	1
S+S RESEARCH + DEVELOPMENT CORPORATION	1
TREADWELL CORP.	1
AMERICAN CYANAMID COMAPANY	1
UNITED STATES OF AMERICA, ARMY	1
UNIVERSITY COLLEGE OF NORTH WALES	1
WILLIAMS, INC.	1
WAVEPOWER LIMITED	1
WINDSUNWATT, INC.	1

ASSIGNEO PATENTING(1/69 - 12/78) - - ALPHA LISTING

ALLIS-CHALMERS CORPORATION
3496724 - MAIN STEAM LINE OESUPERHEATER SYSTEMS, APPARATUS ANO METHOO

AMERICAN AIR FILTER COMPANY, INC.
3487642 - REFRIGERANT CONOENSER ARRANGEMENT

AMERICAN CYANAMIO COMPANY
4023515 - FLOATING WAVE POWEREO PUMP

AQUALECTRA
3754147 - METHOO AND SYSTEM FOR CONVERSION OF WATER ANO OEVELOPMENT OF POWER

AQUATECH CO., LTO.
4095422 - VERTICAL-AXIS COMPOSITE SWINGING-BLADE WATER WHEEL

COOPER, GEORGE F.
3994134 - APPARATUS FOR POWER GENERATION IN OEEP SEAWATER

FOSTER WHEELER CORPORATION
3705494 - HOLOING SYSTEM FOR STEAM POWER CYCLE

INSITUFORM (PIPES + STRUCTURES) LTO.
4048512 - SYSTEM FOR GENERATING POWER FROM WAVE MOTIONS OF THE SEA

INTERNATIONAL TELEPHONE AND TELEGRAPH CORPORATION
3449589 - POWER SUPPLY SYSTEM

LAITRAM CORPORATION
3818703 - WAVE ENERGY CONVERTER ARRAY
3818704 - APPARATUS FOR CONVERTING THE ENERGY OF OCEAN WAVES

L C STEINMULLER GMBH
3423933 - CYCLIC PROCESS FOR STEAM POWER PLANTS

LUCAS INOUSTRIES LIMITEO
4118932 - ENERGY CONVERSION SYSTEMS

MARTIN + BOTTING OEVELOPMENTS LIMITEO
3485038 - HYORAULICALLY OPERABLE ORIVE MEANS

OCEAN POWER GENERATION, INC.
3828557 - ELECTRIC GENERATING APPARATUS CONVERTING THE PUSHING ACTION OF WAVES INTO ELECTRICAL POWER

OMARK INOUSTRIES, INC.
3494125 - POWOER ACTUATED TOOL

S+S RESEARCH + DEVELOPMENT CORPORATION
3697764 - METHOO ANO APPARATUS FOR GENERATING ELECTRICITY

SULZER BROTHERS LIMITEO
3488961 - METHOO ANO APPARATUS FOR REGULATING A STEAM HEATING-POWER PLANT
3503208 - CO/2\ GAS TURBINE POWER PLANT

ASSIGNED PATENTING(1/69 - 12/78) - - ALPHA LISTING

THERMO ELECTRON CORPORATION
3984982 - ANNULAR TIDAL REGENERATOR HEAT ENGINE
3986360 - EXPANSION TIDAL REGENERATOR HEAT ENGINE

TREADWELL CORP.
3631670 - DEVICE TO EXTRACT POWER FROM THE OSCILLATION OF THE SEA

UNITED STATES OF AMERICA, ARMY
3698183 - INITIATOR BOOSTER

UNITED STATES OF AMERICA, NAVY
3569725 - WAVE-ACTUATED POWER GENERATOR-BUOY
3595189 - WAVE-ACTUATED LOAD COMPENSATOR

UNIVERSITY COLLEGE OF NORTH WALES
3696251 - METHOD OF GENERATING ELECTRICITY AND ELECTRICAL GENERATOR

WAVEPOWER LIMITED
4098084 - APPARATUS FOR EXTRACTING ENERGY FROM WAVE MOVEMENT OF THE SEA

WESTINGHOUSE ELECTRIC CORP.
3590263 - TRANSVERSE ANCHOR ARRANGEMENT FOR A TURBINE POWER PLANT
3989951 - WAVE ENERGY POWER GENERATING BREAKWATER

WILLIAMS, INC.
4077213 - WAVE DRIVEN GENERATOR

WINDSUNWATT, INC.
3938907 - HORIZONTAL MULTIDIRECTIONAL TURBINE WINDMILL

UNASSIGNEO PATENTS (1/75-12-78) INVENTORS (ALPHA LISTING)

INVENTOR NAME			STREET	CITY	ST	ZIP/CNTRY
ANOERSON	RAY	C.	6655 S. NEW HAVEN	TULSA	OK	74136
3961479 - ENERGY CONVERTING HYORAULIC BUOYANT MOTOR						
ATENCIO	FRANCISCO	JOSE	ENTRE RIOS 3105	DIAMANTE		AR
4078388 - TRANSPORTABLE HYDROMOTIVE ASSEMBLY						
ATENCIO	FRANCISCO	JOSE	OIAMANTE 3105	ENTRE RIOS		AR
4073146 - SUBMERSIBLE OIFFUSER						
ATHERTON	OEWITT	T.	407 WEST E. ST.	ENCINITAS	CA	92024
3973864 - TIOE MOTOR						
AXFORD	ROY	MORGAN	NO. 5 RINGBIT	ROLLING HILLS	CA	90274
4002416 - MOTOR POWEREO BY WAVE ACTION						
BABINTSEV	IVAN	ANOREEVIC	BULVAR YANA RAINISA, 20, KORPU	MOSCOW		SU
3922739 - APPARATUS FOR CONVERTING SEA WAVE ENERGY INTO ELECTRICAL ENERGY						
BAILEY	OAVIO	ZABRISKIE	214 BOWEN ST.	PROVIOENCE	RI	02906
3978345 - SYSTEM FOR UTILIZING ENERGY IN A FLUID CURRENT						
BAILEY	VERNON		2424 PEACH ORCHARO ROAO	AUGUSTA	GA	30906
3918261 - WAVE AND TIOE MOTOR						
BARWICK	WILLIAM	M.	RTE. 5, BOX 234	WASHINGTON	NC	27889
3925986 - AIR ENGINE						
BLACK	JERIMIAH	B.	2065 CHURCH CREEK ORIVE	CHARLESTON	SC	29407
4038821 - FLUIO CURRENT MOTOR						
BOLOING	RICHARO	D.	2005 STONEHURST	RIALTO	CA	92376
4013379 - WAVE-POWEREO PNEUMATIC SYSTEM FOR POWER GENERATION						
BROWN	HENRY	C.	410 CRUSAOER OR.	OALLAS	TX	75221
4111610 - WAVE-POWERED, PIVOTEO FLOAT PUMPING SYSTEM WITH INCREASING OPPOSITION TO EXTREME MOVEMENT OF LEVER ARM						
CHAPPELL	WALTER	L.	700 GEARS ROAO, NO. 169	HOUSTON	TX	77067
4023041 - APPARATUS FOR GENERATING ELECTRICITY AND POWER FROM NATURAL WATER FLOW						
COHEN	NATHAN		19 OLIVE	GREAT NECK	NY	11022
4079264 - WINO OR WATER OPERATED POWER PLANT						
CONN	JOHN	L.	C/O GEORGE SPECTOR, 3615 WOOLW	NEW YORK	NY	10007
3918827 - FUFL LESS WATER PRESSURE MACHINE						
CONN	JOHN	L.	3615 WOOLWORTH BLDG., 233 BROA	NEW YORK	NY	10007
4034231 - OCEAN TIOE AND WAVE ENERGY CONVERTER						
COREY	GEORGE		6340 LANKERSHIM BLVO.	N. HOLLYWOOD	CA	91606
4108578 - RACK AND PINION WAVE MOTOR POWER PLANT						
DECKER	BERT	J.	136 CAPEN BLVO.	BUFFALO	NY	14226
3952517 - BUOYANT RAM MOTOR AND PUMPING SYSTEM						

UNASSIGNED PATENTS (1/75-12-78) INVENTORS (ALPHA LISTING)

INVENTOR NAME			STREET	CITY	ST	ZIP/CNTRY
DECKER	BERT	J.	136 CAPEN BLVD.	BUFFALO	NY	14226
4123667 - WAVE ENERGY GENERATOR-BREAKWATER-BARGE-DOCK						
DIAMOND	DAVID		2773 MILL AVE.	BROOKLYN	NY	11234
3934964 - GRAVITY-ACTUATED FLUID DISPLACEMENT POWER GENERATOR						
DICKMAN	SMITH	V.	1807 27TH ST., WEST	BRADENTON	FL	33505
3993913 - TIDEWATER POWER SYSTEM						
DIGGS	RICHARD	E.	S. 12A ROAD, P.O. BOX 776	CARTHAGE	MO	64836
4013382 - WAVE POWER APPARATUS SUPPORTED AND OPERATED BY FLOATS IN WATER						
4039847 - TIDEWATER POWER PLANT						
DOAK	LYLE	E.	30 E. GOLDEN LAKE ROAD	CIRCLE PINES	MN	55014
3937168 - BILGE PUMP						
DONATO	AMANCIO	S.	140 KAINGIN ROAD, SAN FRANCISC	QUEZON CITY		RP
4078382 - METHOD AND APPARATUS FOR DERIVING USEFUL ENERGY FROM SEA WAVES						
FILIPENCO	GREGORY	D.	158 GREEN ST.	NEW YORK	NY	
3912938 - ELECTRICAL STATIONS OPERATED BY WAVES						
GARZA	ROBERTO	M.	P.O. BOX 7036	SAN ANTONIO	TX	78207
4092828 - HYDROELECTRIC PLANT						
GATTON	WILLIAM	R.	P.O. BOX 222	PORT REPUBLIC	NJ	08241
3970415 - ONE WAY VALVE PRESSURE PUMP TURBINE GENERATOR STATION						
GICONI	RENELL	A.	12 PARK DRIVE	LAVALE	MD	21502
3987307 - PARTICULATE MATERIAL POWERED PRIME MOVER						
GILL	WALTER	L.	225 S. BUENA VISTA	REDLANDS	CA	92373
3861487 - ELECTRIC POWER MEANS FOR VEHICLES						
GORLOV	ALEXANDER	MOISEEVIC	234 MAIN ST.	BRIGHTON	MA	02155
4103490 - APPARATUS FOR HARNESSING TIDAL POWER						
GRAFF	ALBERT	L.	32 WILSON ST.	PITTSBURGH	PA	15223
4001597 ELECTRIC POWER GENERATING SYSTEM						
GRANATH	ALF		APELVAGEN 15	141 46 HUDDINGE		SW
4076447 - WATER-POWER MOTOR						
GREGG	HAROLD			PETALUMA	CA	
4022549 - SHORELINE AIR COMPRESSORS WHEREIN SWELL WATER PUMPS THE AIR						
GUSTAFSON	MANFRED	WALLACE	GAMLA FAGERSTAVAGEN 4	773 00 FAGERSTA		SW
3965364 - WAVE GENERATOR						
HAGEN	ALF	R.	16249 36TH AVE., NE.	SEATTLE	WA	98155
4123185 - FLOATING BREAKWATER AND ENERGY COLLECTING SYSTEM						

UNASSIGNED PATENTS (1/75-12-78) INVENTORS (ALPHA LISTING)

INVENTOR NAME			STREET	CITY	ST	ZIP/CNTRY
HENDEL	FRANK	J.	721 JOHNSON AVE. #83	SAN LUIS OBISPO	CA	93401
4110630 - WAVE POWERED ELECTRIC GENERATOR						
HERBERG	GEORGE	M.		GONVICK	MN	56644
3996741 - ENERGY STORAGE SYSTEM						
HERZ	HARRY		1200 HURLBUT AVE.	SEBASTOPOL	CA	95472
3922012 - POWER GENERATOR						
HOOPER	LEE	EZEKIEL III	11 SANDPIPER ROAD	TAMPA	FL	33609
3961863 - WATER ACTION POWERED PUMP						
HORVATH	JANOS		R.R. 1, BOX 44	MARTINSVILLE	IN	46151
4084375 - METHOD AND APPARATUS FOR GENERATING BUOYANCY POWER VIA ELECTROLYSIS						
HUANG	KWANG	TA	7241 MESA CIR.	VENTURA	CA	93003
4081962 - DYNAMIC WAVE ENERGY EXTRACTION SYSTEM						
HULTMAN	DENNIS	C.	11035 EARLY DAWN ROAD	TURLOCK	CA	95380
4026587 - UNDERWATER TURBINE OPERATED BY OCEAN CURRENTS						
JACKSON	ANDREW	W. SR.	P.O. BOX 646	GADSDEN	AL	35901
4083186 - APPARATUS AND METHOD FOR CONVERTING HYDROSTATIC ENERGY TO ELECTRICAL ENERGY						
JACKSON	ARLYN	H.	3128 MONTEREY ST.	OXNARD	CA	93030
4091618 - OCEAN MOTION POWER GENERATING SYSTEM						
JOHNSON	CHARLES	M.	9451 E. AVE. T-12	LITTLEROCK	CA	93543
4054031 - POWER UNIT						
KAPLAN	SAUL		405 HIGHLAND AVE.	MERION	PA	19066
3894241 - WAVE ACTION POWER SOURCE						
KIKUT	EDMUNDO		AVENIDA 8 CALLES 5-7	SAN JOSE		CR
4122676 - APPARATUS FOR EXTRACTING ENERGY FROM WAVE MOTION						
KURTZBEIN	EARL	D.	711 W. 46TH ST.	VANCOUVER	WA	98663
4001596 - WAVE AND CURRENT OPERATED POWER GENERATING DEVICE						
LEBOST	BARRY	ALAN	3224 GRAND CONCOURSE	BRONX	NY	10468
4057270 - FLUID TURBINE						
LIU	FRANCIS	C.	123 W. LOOP DR.	CAMARILLO	CA	93010
4081962 - DYNAMIC WAVE ENERGY EXTRACTION SYSTEM						
LLOYD	HAROLD		67 CASSELMAN PLACE	CHULA VISTA	CA	92010
3957398 - WAVE ENERGIZED PUMP						
LOEB	ARNOLD		2956 W. LUNT AVE.	CHICAGO	IL	60645
4124182 - WIND DRIVEN ENERGY SYSTEM						
LOIS	LAMBROS		4857 BATTERY LANE, APT. 406	BETHESDA	MD	20014
3924827 - APPARATUS FOR EXTRACTING ENERGY FROM WINDS AT SIGNIFICANT HEIGHT ABOVE THE SURFACE						

UNASSIGNED PATENTS (1/75-12-78) INVENTORS (ALPHA LISTING)

INVENTOR NAME	STREET	CITY	ST	ZIP/CNTRY
LONG CHARLES S.	WINESAP ROAD, RTE. 8, BOX 303	JONESBORO	AR	72401
4009395 - WAVE AND TIDE ACTUATED HYDRAULIC ELECTRICAL GENERATING APPARATUS				
LOQVIST KAJ-RAGNAR	REGNBAGSVAGEN 40	773 00 FAGERSTA		SW
3965364 - WAVE GENERATOR				
LOVMARK AUGUST OTTO	8710 CYPRESS AVE.	COTATI	CA	94928
3974652 - DEVICE FOR CONVERTING WAVE ENERGY IN BODIES OF WATER				
MAHNEKE KLAUS M.	228-66TH ST.	DELTA, BRITISH COLUM		CA
3918260 - WAVED-POWERED DRIVING APPARATUS				
MARTINEZ ANTERO	P.O. BOX 1631	SANTO DOMINGO		DO
4108579 - WAVE MOTOR				
MATTERA HENRY A.	736 FERN ST.	YEADON	PA	19050
3870893 - WAVE OPERATED POWER PLANT				
4009396 - WAVE OPERATED POWER PLANT				
MCVEIGH CHARLES E.	107 W. 9TH ST.	LACON	IL	61540
4034565 - METHOD AND APPARATUS FOR GENERATING POWER				
NEVILLE ROBERT LEE	1180 HALLINAN	LAKE OSWEGO	OR	97034
3911287 - WAVE DRIVEN POWER GENERATORS				
OOTSU .FUMIO	6-4, SHIRAHAE-CHO	SASEHO NAGASAKI		JA
4071305 - TRANSDUCER FOR CONVERSION OF TIDAL CURRENT ENERGY				
PARADISO ERASMUS J.	R.F.D. NO. 1	WEST EDMESTON	NY	13485
3965679 - WAVE ENERGY MACHINE				
PARR EDWARD L.	301 N. CUYAMACA	EL CAJON	CA	92020
3965365 - POWER GENERATING MACHINE ACTUATED BY OCEAN SWELLS				
PERKINS CLIFFORD A. JR.	5851 KEOKUK AVE.	WOODLAND HILLS	CA	91634
4078871 - SEA WAVE ENERGY CONVERSION				
PETERSON CHARLES A. JR.	365 WILLOW AVE.	SCOTCH PLAINS	NJ	07076
4086775 - METHOD AND APPARATUS FOR GENERATING POWER BY SEA WAVE ACTION				
PICKLE WILLIAM H.		KNOXVILLE	TN	
4125346 - RANDOM WAVE HYDRAULIC ENGINE				
PINNEY PAUL E.	48 LINDEN AVE.	LINCOLN PARK	NJ	07035
4076464 - DUAL WAVE MOTION PUMP				
PITTS MARLENE M.	245 MERION AVE.	ALDAN	PA	19018
4009396 - WAVE OPERATED POWER PLANT				
PORTER WILLIAM H.	355 WESTBOURNE ST.	LA JOLLA	CA	92037
3988592 - ELECTRICAL GENERATING SYSTEM				

UNASSIGNED PATENTS (1/75-12-78) INVENTORS (ALPHA LISTING)

INVENTOR NAME			STREET	CITY	ST	ZIP/CNTRY
PUNTON	GEORGE	C.	10977 HORIZON HILLS	EL CAJON	CA	92020
3907454 - COMPRESSED GAS MACHINE						
REID	ALISTER	URE	"KYLEAKIN," NORRELS DRIVE	EAST HORSLEY, SURREY		EN
3983702 - HYDRAULIC ENERGY EXTRACTOR						
RHODES	WILLIAM	A.	4421 N. 13TH PL.	PHOENIX	AZ	85016
4095426 - TURBINE AND METHOD OF USING SAME						
RICAFRANCA	ROMULO	M.	749 ATES ST. STA. MESA	MANILA		RP
4078382 - METHOD AND APPARATUS FOR DERIVING USEFUL ENERGY FROM SEA WAVES						
RUSBY	JOSEPH	V.	2230 GRANADA DRIVE	SOUTH DAYTONA	FL	32019
3959663 - TIDE-POWERED ELECTRICAL GENERATOR						
SALTER	STEPHEN	HUGH	143 E. TRINITY ROAD	EDINBURGH, EH53 PP		SC
3928967 - APPARATUS AND METHOD FOR EXTRACTING WAVE ENERGY						
SAXMANN	PAUL	E.	6120 E. 21ST ST.	INDIANAPOLIS	IN	46218
3883261 - POWER MEANS						
SCHERA	ENOS	L. JR.	8254 S.W. 37TH ST.	MIAMI	FL	33155
3898471 - ELECTRIC GENERATOR RESPONSIVE TO WAVES IN BODIES OF WATER						
SCHERA	ENOS	L. JR.	8254 SW. 37 ST.	MIAMI	FL	33155
4071114 - MOTION OPERATED POWER APPARATUS						
SCHMELLER	EDMUND			CHEWELAH	WA	99109
3882320 - TIDE ENERGY CONVERSION DEVICE						
SCHUR	GEORGE	O.	3775 SW. 108TH AVE.	MIAMI	FL	33165
3916626 - THERMALLY POWERED GENERATING SYSTEM EMPLOYING A HEAT VAPOR BUBBLE ENGINE						
SHAW	JOHN	B.	1812 E. MARLETTE	PHOENIX	AZ	85016
4028893 - OPEN CYCLE SOLAR ENERGY SYSTEM UTILIZING BUOYANCY AS A CONVERSION FORCE						
SHAW	JOHN	S.	1812 E. MARLETTE	PHOENIX	AZ	85016
4038826 - SOLAR ENERGY SYSTEM UTILIZING BUOYANCY AS A CONVERSION FORCE						
SHERRARD	WILLIAM	A.	25 S. GARFIELD ST.	CLEONA	PA	17042
3983404 - SURF-TURBINE GENERATING SYSTEM						
SIEGEL	ISRAEL		351 W. 71 ST.	NEW YORK	NY	10023
4041705 - LOW TEMPERATURE ENGINE						
SIEGEL	ISRAEL		351 W. 71ST ST.	NEW YORK	NY	10023
4036017 - LOW PRESSURE ENGINE						
SMITH	ROLAND	L.	450 SE. 8TH ST.	HOMESTEAD	FL	33030
4115034 - VEHICLE-ACTUATED AIR COMPRESSOR AND SYSTEM THEREFOR						
SPECTOR	GEORGE		3615 WOOLWORTH BLDG., 233 BROA	NEW YORK	NY	10007
4034231 - OCEAN TIDE AND WAVE ENERGY CONVERTER						

UNASSIGNED PATENTS (1/75-12-78) INVENTORS (ALPHA LISTING)

INVENTOR NAME	STREET	CITY	ST	ZIP/CNTRY
SPECTOR GEORGE	3615 WOOLWORTH BUILDING, 233 B	NEW YORK	NY	10007
3918827 - FUEL LESS WATER PRESSURE MACHINE				
STRAUMSNES O. ROBERT	ONE BRYANT CRESCENT	WHITE PLAINS	NY	10602
3928771 - WATER CURRENT POWER GENERATOR SYSTEM				
TAH-SUN LIN	3RD FL., 146 CHANG CHUN ROAD	TAIPEI		CT
3994629 - MECHANISM FOR TAPPING THE SURF ENERGY				
TIDWELL HUBERT	BOX 57	WELLINGTON	UT	84542
3922013 - WAVE MOTOR				
4103494 - WAVE AND TIDE MOTOR				
TORNABENE MICHAEL G.	462 - 7TH AVE.	NEW YORK	NY	10018
3930168 - WAVE-ACTION POWER APPARATUS				
TORNABENE MICHAEL G.	462-7TH AVE.	NEW YORK	NY	10018
4073142 - WAVE-ACTION POWER APPARATUS				
TORNABENE MICHAEL G.	C/O AMANDA MACHINE CORP., 285	WEST ISLIP	NY	11795
3964264 - WAVE-ACTION UNDERSEA-DRILLING RIG				
TORNABENE MICHAEL G.	285 OAK NECK LANE	WEST ISLIP	NY	11795
4048801 - PROCESS AND DEVICE FOR HARNESSING WAVE ENERGY				
TORNKVIST ROLF E.	RITOBERGSVAGEN 8-16 L	00330 HELSINGFORS 33		SF
4036563 - WAVE MOTOR COMPRISED OF A SUBMERGED FLOATING NETWORK OF CHAMBERS FORMED BY WALLS PERMITTING VARIABLE GEOMETRY				
TURNEY SAYLES A.	RANCHO GRANDE	NORTH FORK	NV	89801
4129988 - TIDAL POWER PLANT OR THE LIKE				
WATERS FRED L.	C/O TRANSWORLD DRILLING COMPAN	OKLAHOMA CITY	OK	73125
4105368 - FLOATING WAVE POWERED PUMP				
WELCZER MORDECHAI	BUSTHNAI 4	RAMAT HASHARON		IL
4076463 - WAVE MOTOR				
WEST WILLIAM S.	380 CLIFF DRIVE APT. 2	PASADENA	CA	91107
3961480 - PRESSURE SOURCE AND SYSTEMS INCORPORATING IT				
WEST WILLIAM S.	380 CLIFF DRIVE, APT. 2	PASADENA	CA	91107
4074526 - PRESSURE SOURCE AND SYSTEMS INCORPORATING IT				
WIDECRANTZ KAJ	P.O. BOX 72	PORT REPUBLIC	NJ	08241
3970415 - ONE WAY VALVE PRESSURE PUMP TURBINE GENERATOR STATION				
YAMADA KIICHI	NO. 15-12, 1-CHOME JINGUMAE	TOKYO		JA
3879950 - SPECIAL POWER GENERATING UNIT USING COMPRESSED AIR PRODUCED BY OCEAN WAVE TOGETHER WITH SUPER-HEATED STEAM				

PATENTS (1/63-12/78) WITH NEITHER ASSIGNMENT NOR INVENTOR INFORMATION IN DATABASE

3426540 - TIDEWATER POWER GENERATION SYSTEM

PATENTS (1/63-12/78) WITH NEITHER ASSIGNMENT NOR INVENTOR INFORMATION IN OATABASE

3448580 - PEAK OUTPUT PROOUCTION IN STEAM TURBINE PLANTS
3466866 - HYOROPNEUMATIC POWER WHEEL
3487228 - POWER GENERATING SYSTEM
3515889 - POWER GENERATION APPARATUS
3532440 - TIOALLY OPERATEO SYSTEM FOR PUMPING WATER OUT OF BOATS ANO FLOATING DOCKS
3546473 - OCEANOGRAPHIC GENERATOR
3567953 - TIOE-OPERATEO POWER PLANT
3580695 - BILGE PUMP FOR BOATS
3603804 - WAVE OPERATEO POWER APPARATUS
3628332 - NON-POLLUTING CONSTANT OUTPUT ELECTRIC POWER PLANT
3641762 - FLOATING TURBINE CONSTRUCTION
3644052 - SEA WAVE POWER GENERATOR
3645091 - GUN-TYPE OEVICE FOR MECHANICAL ASSEMBLY WORK UTILIZING ENERGY OF EXPLOSION
3664125 - OFFSHORE POWER CONVERSION APPARATUS
3668412 - APPARATUS FOR HARNESSING THE VERTICAL MOVEMENT OF OCEAN TIDES AND UTILIZE THE FORCE FOR GENERATING ELECTRICAL ENERGY
3685291 - POLLUTION FREE ELECTRIC POWER AND WATER PROOUCING STATION UTILIZING THE KINETIC ANO POTENTIAL ENERGY OF WATER WIND WAVES
3687567 - WAVE POWERED GENERATOR
3690790 - TIOE-POWERED UNIT ANO FLOATING PLATFORM UTILIZING SAME
3706507 - TIOE-ACTUATEO MACHINE
3715885 - HEAT VAPOR OIFFERENTIAL ENGINE
3746875 - ELECTRICAL POWER PLANT ORIVEN BY OCEAN WAVES ANO TIOES
3758083 - WAVE-POWEREO AERATOR
3758788 - CONVERSION SYSTEM FOR PROVIOING USEFUL ENERGY FROM WATER SURFACE MOTION
3771920 - PUMP MEANS
3774048 - ENERGY GENERATING ANO SORTING ASSEMBLY FOR MARINE STRUCTURE
3777494 - WAVE ENERGY MOTORS
3783302 - APPARATUS ANO METHOO FOR CONVERTING WAVE ENERGY INTO ELECTRICAL ENERGY
3808445 - WAVE OPERATEO POWER PLANT
3817662 - WAVE MOTOR
3857242 - GRAVITY-BUOYANCY MOTOR
4060344 - TRANSOUCER FOR CONVERSION OF SEA WATER-ENERGY
4098081 - TIOAL POWER PLANT ANO METHOO OF POWER GENERATION

3084905	3104521	3117422	3120212	3122889	3125851	3126830	3135096	3140588	3149776	3151564	3153329
3163009	3163991	3166909	3166910	3185254	3191538	3194008	3194020	3200255	3200581	3204110	3205664
3224199	3228189	3231749	3238729	3242678	3243953	3250220	3259361	3259362	3268154	3271953	3271959
3274941	3289415	3289592	3292365	3292366	3295320	3297300	3306044	3307827	3312064	3320740	3320752
3335667	3352107	3353787	3359732	3360926	3362336	3377800	3389888	3390525	3394658	3411299	3413805
3413808	0	0	0	0	0	0	0	0	0	0	0

TIDE AND WAVE ENERGY USE

PATENTING UPDATE (1/79-10/79)

Patent No.	Assignee & Title
4,132,901	Don Crausbay, P.O. Box 1279, St. Thomas, VI 00801: Electric Power Generating System
4,134,023	The Sec. of State for Energy of the UK of G.B. & N. Ireland, England: Apparatus For Use In The Extraction Of Energy From Waves On Water
4,134,710	DeWitt T. Atherton, 407 W. E St., Encinitas, CA 92024: Simultaneous Plural-Directional Flow Motor
4,135,366	Israel Siegel, 351 W. 71 St., NY, NY 10023: Valveless Differential Temperature Engine
4,137,005	Outdoor Enterprises of America, Inc.: Oceanic Wave Powered Prime Mover
4,139,984	The Sec. of State for Energy of the UK of G.B. & N. Ireland, England: Device For Deriving Power From Wave Energy
4,141,218	Eric R. Rayboy, Apt. J-215, 11273 N. Kendall Dr., Miami, FL 33176: Buoyancy Operated Sunmill
4,141,670	The Sec. of State for Energy of the UK of G.B. & N. Ireland, England: Device For Extracting Energy From Water Waves
4,142,823	Eugene Nickell, Eldon Glenn Nickell and Earl Jerome Nickell: Current Power Plant
4,143,990	Francisco J.G. Atencio, Estafeta Dr. Garcia, Diamante Entre Rios, Argentina: Dam With Movable Hydroelectric Assembly
4,145,882	Ivar Thorsheim, Kalkfjellet 15, 1370 Asker, Norway: Wave Power Generator
4,145,885	Yedidia Solell, Rav-Ashi 1, Tel Aviv, Israel: Wave Motor
4,149,092	Spie-Batignolles and Societe Generale de Techniques et d'Etudes: System For Converting The Randomly Variable Energy Of A Natural Fluid
4,151,423	Frank J. Hendel, 721 Johnson St., San Luis Obispo, CA 93401: Flowing Saline Water Magnetohydrodynamic Electric Generator

4,152,895 Lockheed Corporation: Wave Powered Motor

4,152,898 Bechtel International Corporation: Energy Transfer Appartus And Method Using Geothermal Brine

4,156,347 Huan-Hsiung Meng, No. 5, Chung Ta Hsin Ts'un, Chung Li, Taiwan: Process For Actuating A Hydraulic Prime Mover Through Conversion Of Energy In Water Current

4,158,780 Eric Wood, 42 Haggs Hill Rd., Ossett, W. Yorkshire, England: Power Generation Systems In Buoyant Structures

4,159,188 Francisco J.G. Atencio, 3105 Diamante, Entre Rios, Argentina: Dam With Reversible Hydroelectric Station

4,160,624 Nu Watt, Inc.: Water Vehicle-Actuated Air Compressor And System Therefor

4,162,409 CUV "Progress," Sofia, Bulgaria: Device For Converting The Energy Of Sea Water

4,163,633 Joseph A. Vriend, P.O. Box 505, Squamish, B.C. Canada (VON 3GO): Apparatus For Producing Power From Water Waves

4,163,905 Fred E. Davison, Highwood, Mont. 59450: Electric Generating Water Power Device

4,164,383 Michael J. French, UK Atomic Energy Authority, 11 Charles II St., London UK: Water Wave Energy Conversion Device Using Flexible Membranes

4,170,114 Robert L. Pruett, Rt. 2, Box 69, Gardnerville, NV 89410: Recirculating Submersible Turbine

4,170,428 Francisco J.G. Atencio, 3105 Diamante, Entre Rios, Argentina: Dam With Suspended Hydroelectric Station

4,170,738 Q Corporation: Energy Device Powered By The Motion Of Water Beneath Waves

4,171,189 Gus Schreiber, 1430 Medical Arts Bldg., Dallas, TX 75201: Lift-force Pump Activated By The Weight And Buoyancy Of Giant Buoys

4,172,689 Ivar Thorsheim, Kalkfjellet 15, 1370 Asker, Norway: Wave Power Generator

GEOTHERMAL AND OTHER NATURAL TERRESTRIAL HEAT ENERGY

This profile includes systems which are responsive to thermal energy obtained from a natural terrestrial source (earth or water) to generate power. Included are systems which derive their power from geothermal heat sources or from temperature differentials in natural fluids, as in various layers of sea water.

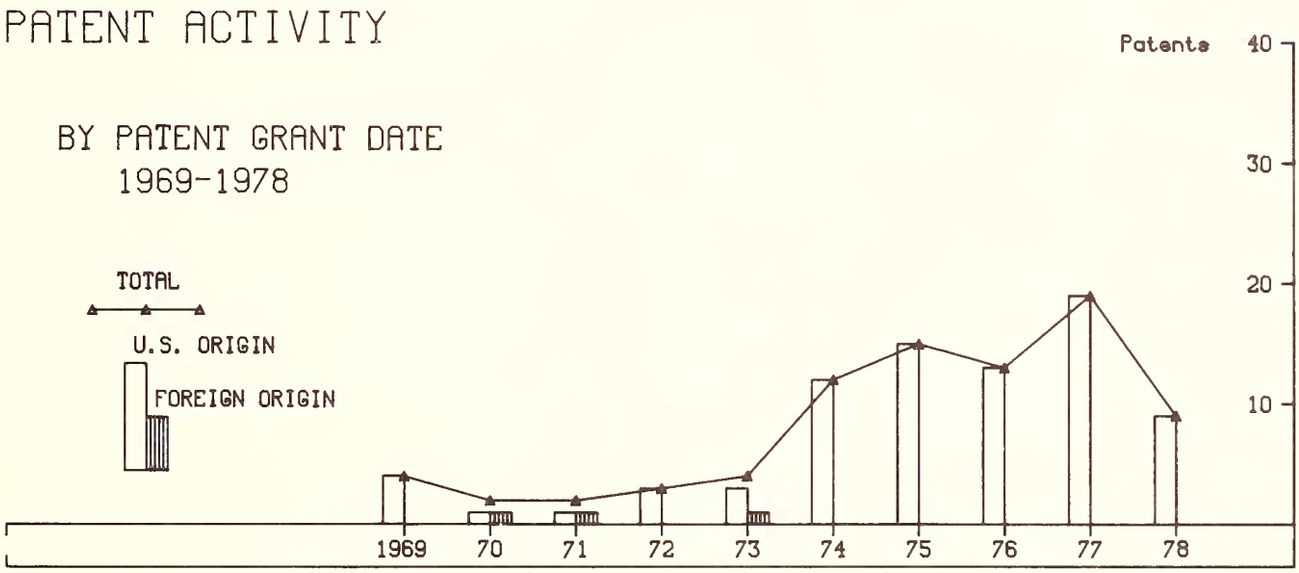
INCLUDED IN THIS PROFILE ARE SELECTED PATENTS FROM:

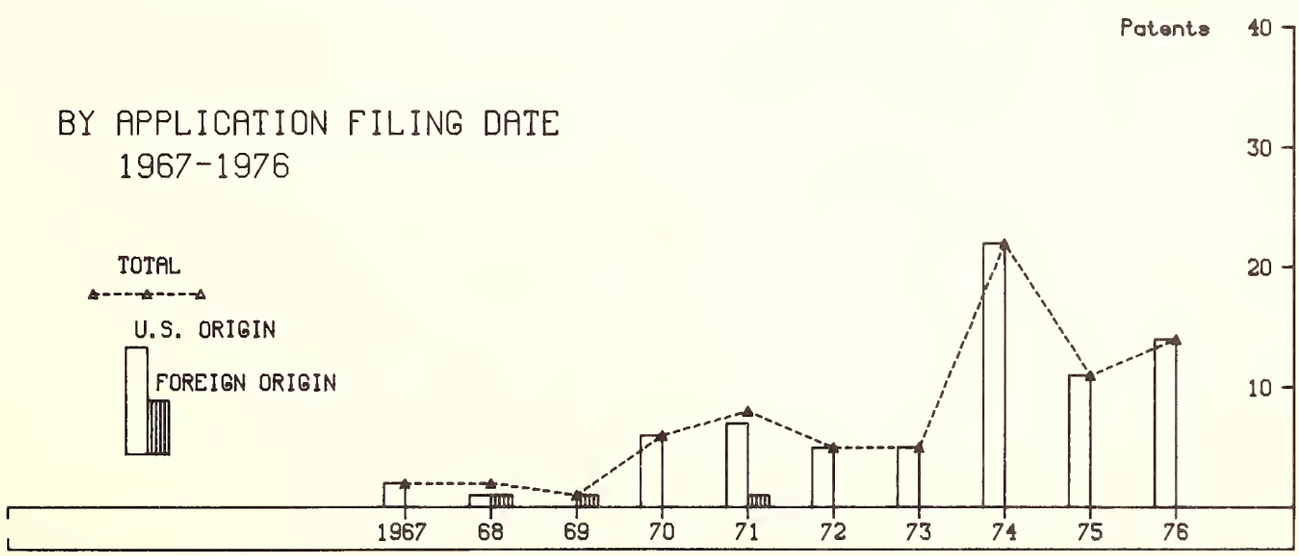
Class 60, Subclasses 398,641,698
Class 415, Subclasses 2-5,7,8
Class 416, Subclasses 37,41,85
Class 417, Subclasses 334,379

ACTIVITY INDICES (1976-1978)

GROWTH	49.4%
FOREIGN SHARE	0.0%
CORPORATE OWNED	51.2%
GOVERNMENT OWNED	2.4%
U.S. OWNED OF FOREIGN	0.0%

PATENT ACTIVITY





SOLAR ENERGY - GEOTHERMAL + OTHER NATURAL TERRESTRIAL HEAT ENERGY

PATENT ACTIVITY (1963-1978) BY DATE OF PATENT GRANT

	NUMBER OF PATENTS															
	63-64	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	TOTAL
TOTAL	1			2	1	4	2	2	3	4	12	15	13	19	9	87
U.S. ORIGIN	1			2	1	4	1	1	3	3	12	15	13	19	9	84
FOREIGN ORIGIN							1	1		1						3
CANADA										1						1
PHILIPPINES							1									1
JAPAN								1								1
U.S. ORIGIN	1			2	1	4	1	1	3	3	12	15	13	19	9	84
U.S. CORP. OWNED					1	1			2	1	8	10	6	13	2	44
U.S. GOVT. OWNED									1			1			1	3
U.S. INDIV. OWNED	1			2		3	1	1		2	4	4	7	6	6	37
FOREIGN OWNED																
FOREIGN ORIGIN							1	1		1						3
U.S. OWNED																
FOREIGN OWNED							1	1		1						3
FOREIGN CORP.								1								1
FOREIGN GOVT.																
FOREIGN INDIV.							1			1						2

SOLAR ENERGY - GEOTHERMAL + OTHER NATURAL TERRESTRIAL HEAT ENERGY

PATENT ACTIVITY (PATENTS GRANTED 1/67-12/78) BY DATE OF PATENT APPLICATION

	NUMBER OF PATENTED APPLICATIONS														
	PRE 65	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	TOTAL
TOTAL		4	2	2	2	1	6	8	5	5	22	11	14	4		86
U.S. ORIGIN		4	2	2	1		6	7	5	5	22	11	14	4		83
FOREIGN ORIGIN					1	1		1								3
CANADA								1								1
PHILIPPINES					1											1
JAPAN						1										1
U.S. ORIGIN		4	2	2	1		6	7	5	5	22	11	14	4		83
U.S. CORP. OWNED		1	1				4	4	4	1	12	6	11			44
U.S. GOVT. OWNED							1				1			1		3
U.S. INDIV. OWNED		3	1	2	1		1	3	1	4	9	5	3	3		36
FOREIGN OWNED																
FOREIGN ORIGIN					1	1		1								3
U.S. OWNED																
FOREIGN OWNED					1	1		1								3
FOREIGN CORP.						1										1
FOREIGN GOVT.																
FOREIGN INDIV.					1			1								2

GEOTHERMAL AND OTHER NATURAL TERRESTRIAL HEAT ENERGY

ASSIGNEES WITH 1 OR MORE PATENTS (1/69 - 12/78)

SPERRY RAND CORPORATION	14
STATHAM INSTRUMENTS, INC.	3
GEOTHERMAL INVESTMENT CO.	3
TEXACO DEVELOPMENT CORPORATION	3
INTERNATIONAL SALT COMPANY	3
MAGMA ENERGY INC.	2
TEXACO INC.	2
UNITED STATES OF AMERICA, DEPARTMENT OF ENERGY	2*
CARRIER CORPORATION	1
DOW CHEMICAL COMPANY	1
FOSTER WHEELER ENERGY CORPORATION	1
CARNEGIE-MELLON UNIVERSITY	1
HUGHES AIRCRAFT COMPANY	1
INTERNATIONAL TELEPHONE AND TELEGRAPH CORPORATION	1
MITSUBISHI HEAVY INDUSTRIES, LTD.	1
LOCKHEED CORPORATION	1
PACIFIC POWER AND PROTEIN, INC.	1
ROGERS ENGINEERING CO., INC.	1
OCCIDENTAL PETROLEUM CORPORATION	1
UNITED STATES OF AMERICA, ARMY	1
CHEVRON RESEARCH COMPANY	1
SEA SOLAR POWER, INC.	1
GENERAL MOTORS CORPORATION	1

*COMPOSITE TOTAL, SEE APPENDIX A

ASSIGNED PATENTING(1/69 - 12/78) - - ALPHA LISTING

CARNEGIE-MELLON UNIVERSITY
3805515 - MODULARIZED SEA POWER ELECTRICAL GENERATOR PLANT

CARRIER CORPORATION
4063417 - POWER GENERATING SYSTEM EMPLOYING GEOTHERMALLY HEATED FLUID

CHEVRON RESEARCH COMPANY
3862545 - GEOTHERMAL BRINE ENERGY TO GENERATE POWER

DOW CHEMICAL COMPANY
4052857 - GEOTHERMAL ENERGY FROM SALT FORMATIONS

FOSTER WHEELER ENERGY CORPORATION
3972193 - INTEGRAL SEPARATOR START-UP SYSTEM FOR A VAPOR GENERATOR WITH CONSTANT PRESSURE FURNACE CIRCUITRY

GENERAL MOTORS CORPORATION
3939654 - ENGINE WITH DUAL SENSOR CLOSED LOOP FUEL CONTROL

GEOTHERMAL INVESTMENT CO.
3845627 - POWER GENERATION FROM HOT BRINES
3893299 - GEOTHERMAL HEAT RECOVERY BY MULTIPLE FLASHING
4057964 - WORKING FLUIDS AND SYSTEMS FOR RECOVERING GEOTHERMAL OR WASTE HEAT

HUGHES AIRCRAFT COMPANY
4057963 - HEAT PIPE CAPABLE OF OPERATING AGAINST GRAVITY AND STRUCTURES UTILIZING SAME

INTERNATIONAL SALT COMPANY
3676078 - SALT SOLUTION MINING AND GEOTHERMAL HEAT UTILIZATION SYSTEM
3858397 - CARRYING OUT HEAT-PROMOTABLE CHEMICAL REACTIONS IN SODIUM CHLORIDE FORMATION CAVERN
3864917 - GEOTHERMAL ENERGY SYSTEM

INTERNATIONAL TELEPHONE AND TELEGRAPH CORPORATION
3449589 - POWER SUPPLY SYSTEM

LOCKHEED CORPORATION
3894393 - POWER GENERATION THROUGH CONTROLLED CONVECTION (AEROELECTRIC POWER GENERATION)

MAGMA ENERGY INC.
3757516 - GEOTHERMAL ENERGY SYSTEM
4043129 - HIGH TEMPERATURE GEOTHERMAL ENERGY SYSTEM

MITSUBISHI HEAVY INDUSTRIES, LTD.
3605403 - TRANSPORTING MEANS AND EQUIPMENT FOR JET ENERGY OF GEOTHERMAL POWER PLANT

OCCIDENTAL PETROLEUM CORPORATION
4027483 - DEVICE FOR CONVERTING INTERNAL ENERGY OF HOT FLUIDS TO SHAFT WORK

PACIFIC POWER AND PROTEIN, INC.
4062189 - METHOD OF PREVENTING THE ACCUMULATION OF MICRO-ORGANISMS IN THERMAL ENERGY CONVERSION SYSTEMS

ASSIGNED PATENTING(1/69 - 12/78) - - ALPHA LISTING

ROGERS ENGINEERING CO., INC.
3782468 - GEOTHERMAL HOT WATER RECOVERY PROCESS AND SYSTEM

SEA SOLAR POWER, INC.
4030301 - PUMP STARTING SYSTEM FOR SEA THERMAL POWER PLANT

SPERRY RAND CORPORATION
3824793 - GEOTHERMAL ENERGY SYSTEM AND METHOD
3898020 - GEOTHERMAL ENERGY SYSTEM AND METHOD
3905196 - GEOTHERMAL ENERGY PUMP THRUST BALANCE APPARATUS
3908380 - GEOTHERMAL ENERGY TURBINE AND WELL SYSTEM
3908381 - GEOTHERMAL ENERGY CONVERSION SYSTEM FOR MAXIMUM ENERGY EXTRACTION
3910050 - GEOTHERMAL ENERGY SYSTEM AND CONTROL APPARATUS
3938334 - GEOTHERMAL ENERGY CONTROL SYSTEM AND METHOD
3939659 - GEOTHERMAL ENERGY SYSTEM FLUID FILTER AND CONTROL APPARATUS
3961866 - GEOTHERMAL ENERGY SYSTEM HEAT EXCHANGER AND CONTROL APPARATUS
3967448 - GEOTHERMAL ENERGY WELL CASING SEAL
4025240 - GEOTHERMAL ENERGY CONTROL SYSTEM AND METHOD
4050517 - GEOTHERMAL ENERGY WELL CASING SEAL AND METHOD OF INSTALLATION
4059959 - GEOTHERMAL ENERGY PROCESSING SYSTEM WITH IMPROVED HEAT REJECTION
4077220 - GRAVITY HEAD GEOTHERMAL ENERGY CONVERSION SYSTEM

STATHAM INSTRUMENTS, INC.
3693370 - THERMODYNAMIC CYCLES
3788091 - THERMODYNAMIC CYCLES
3788092 - THERMODYNAMIC CYCLES

TEXACO DEVELOPMENT CORPORATION
3817038 - METHOD FOR HEATING A FLUID
3827243 - METHOD FOR RECOVERING GEOTHERMAL ENERGY
4110628 - SOLAR SEA POWER SYSTEM

TEXACO INC.
4043386 - ENERGY RECOVERY FROM GEOTHERMAL RESERVOIRS
4060988 - PROCESS FOR HEATING A FLUID IN A GEOTHERMAL FORMATION

UNITED STATES OF AMERICA, ARMY
4104883 - MASS TRANSPORT HEAT EXCHANGER METHOD AND APPARATUS FOR USE IN OCEAN THERMAL ENERGY EXCHANGE POWER PLANTS

UNITED STATES OF AMERICA, ATOMIC ENERGY COMMISSION
3640336 - RECOVERY OF GEOTHERMAL ENERGY BY MEANS OF UNDER-GROUND NUCLEAR DETONATIONS

UNITED STATES OF AMERICA, DEPARTMENT OF ENERGY
3911684 - METHOD FOR UTILIZING DECAY HEAT FROM RADIOACTIVE NUCLEAR WASTES

UNASSIGNEO PATENTS (1/75-12-78) INVENTORS (ALPHA LISTING)

INVENTOR NAME			STREET	CITY	ST	ZIP/CNTRY
ANOERSON	JAMES	HILBERT	1615 HILLOCK LA.	YORK	PA	17403
4102133 - MULTIPLE WELL OUAL FLUIO GEOTHERMAL POWER CYCLE						
ASH	FRANK	ROBERT	834 SHRIVER BLVO.	SPARKS	NV	89403
4094356 - GEOTHERMAL HEAT RECOVERY SYSTEM						
BACIU	PETRU		45-20 48TH ST.	NEW YORK	NY	11377
3875749 - GEOTHERMAL POWER PLANT WITH HIGH EFFICIENCY						
BECK	EARL	J.	3045 GROVE ST.	VENTURA	CA	93003
3967449 - OCEAN THERMAL GRAOIENT POWER PLANT						
OANIELLO	GEORGE	T.	15704 PAMELA OR.	SILVER SPRING	MO	20904
3896622 - MOBILE POWER GENERATION OEVICE EMPLOYING TROPICAL WATER THERMOCLINE						
OIXON	WILLIAM	PAUL	22811 FINCASTLE DR.	KATY	TX	77450
4112687 - POWER SOURCE FOR SUBSEA OIL WELLS						
GILL	GEORGE	HERBERT	1817 W. 21ST ST.	JOPLIN	MO	64801
4085795 - METHOD FOR USING GEOTHERMAL ENERGY						
GREENE	CLARENCE	KIRK	100 N. ARLINGTON AVE.	RENO	NV	89501
3874174 - GEOTHERMAL HEAT EXCHANGE METHOD ANO APPARATUS						
3975912 - GEOTHERMAL OUAL ENERGY TRANSFER METHOO ANO APPARATUS						
JACKSON	ROBERT	E.	6227 STEARNS ST.	RIVERSIOE	CA	92504
3994132 - APPARATUS FOR CONVERTING HEAT ENERGY TO MECHANICAL ENERGY						
LEVOY	LARRY		799 36TH AVE.	SAN FRANCISCO	CA	94121
4047093 - DIRECT THERMAL-ELECTRIC CONVERSION FOR GEOTHERMAL ENERGY RECOVERY						
MARWICK	EDWARO	F.	5149 W. MORSE AVE.	SKOKIE	IL	60076
3938335 - HEAT ENGINES						
RAPPOPORT	MARC	D.	P.O. BOX 10445	PORTLAND	OR	97210
4099381 - GEOTHERMAL ANO SOLAR INTEGRATED ENERGY TRANSPORT ANO CONVERSION SYSTEM						
SHEINBAUM	ITZHAK		2038 E. ALTAOENA DR.	ALTAOENA	CA	91101
4120158 - POWER CONVERSION AND SYSTEMS FOR RECOVERING GEOTHERMAL HEAT						
SPECTOR	DONALO		380 MOUNTAIN ROAO	UNION CITY	NJ	07087
4041707 - UNOERWATER THERMAL ENERGY CONVERSION UNIT						
SWEARINGEN	JUDSON	S.	500 BEL-AIR ROAO	LOS ANGELES	CA	90024
3951794 - GEOTHERMAL POWER METHOD						
4054175 - GEOTHERMAL POWER SYSTEM						
SWEARINGEN	JUDSON	S.	500 BELL AIR ROAD	LOS ANGELES	CA	90024
3935102 - GEOTHERMAL POWER SYSTEM AND METHOD						
VAN HUISEN	ALLEN	T.	29456 INDIAN VALLEY ROAO	ROLLING HILLS ESTATE	CA	90274
4051677 - MULTIPLE-COMPLETION GEOTHERMAL ENERGY PROOUCTION SYSTEMS						

UNASSIGNED PATENTS (1/75-12-78) INVENTORS (ALPHA LISTING)

INVENTOR NAME			STREET	CITY	ST	ZIP/CNTRY
VAN HUISEN	ALLEN	T	29456 INDIAN VALLEY ROAD	ROLLING HILLS ESTATE	CA	90274

4054176 - MULTIPLE-COMPLETION GEOTHERMAL ENERGY PRODUCTION SYSTEMS

WOLF	JOHN	H.	1710 22ND ST.	LAKE CHARLES	LA	70601

3911683 - EFFICIENT AND NONPOLLUTING METHOD FOR RECOVERING GEOTHERMAL HEAT ENERGY

PATENTS (1/63-12/78) WITH NEITHER ASSIGNMENT NOR INVENTOR INFORMATION IN DATABASE

3451342 - CRYOGENIC ENGINE SYSTEM AND METHOD
3468762 - DISTILLATION OF SEA WATER USING STEAM TURBINE ELECTRIC GENERATOR AND SOLAR STILL
3470943 - GEOTHERMAL EXCHANGE SYSTEM
3490513 - RECOVERY OF SALT
3495402 - POWER SYSTEM
3558439 - WATER DESALTING PROCESS AND APPARATUS
3736744 - PROPELLANTS FROM EARTH'S HEAT
3751673 - ELECTRICAL POWER GENERATING SYSTEM
3752395 - WIND MOTOR OPERATED HEATING SYSTEM
3786631 - NITROGEN VAPOR ENGINE
3824156 - DESALINIZATION SYSTEM
3846986 - GEOTHERMAL PLANT CLEANING SYSTEM
3857244 - ENERGY RECOVERY AND CONVERSION SYSTEM
4044830 - MULTIPLE-COMPLETION GEOTHERMAL ENERGY PRODUCTION SYSTEMS
3140986 3312054 3312063 3379248 3957108

GEOTHERMAL AND OTHER NATURAL TERRESTRIAL HEAT ENERGY

PATENTING UPDATE (1/79-10/79)

Patent No.	Assignee & Title
4,132,075	Union Oil Company of CA: Method Of Producing Mechanical Energy From Geothermal Brine
4,132,269	Union Oil Company of CA: Generation Of Electricity During The Injection Of A Dense Fluid Into A Subterranean Formation
4,137,719	Robert W. Rex, 2780 Casalero Dr., La Habra, CA 90631: Method For Energy Extraction From Hot Rock Systems
4,137,720	Robert W. Rex, 2780 Casalero Dr., La Habra, CA 90631: Use of Calcium Halide-Water As A Heat Extraction Medium For Energy Recovery From Hot Rock Systems
4,138,851	Bechtel International Corp.: Apparatus And Method Of Geothermal Energy Conversion
4,142,108	Sperry Rand Corporation: Geothermal Energy Conversion System
4,144,715	Union Oil Company of CA: Method Of Producing Mechanical Energy From Geothermal Fluids
4,149,385	Itzhak Sheinbaum, 2038 E. Altadena Dr., Altadena, CA 91107: Well Stimulation And Systems For Recovering Geothermal Heat
4,151,260	Union Oil Company: Hydrogen Sulfide Abatement In Geothermal Steam
4,163,904	Lawrence Skendrovic, 402 Glencoe Dr., West Mifflin, PA 15122: Understeam Turbine Plant
4,166,363	Societe ITI Ltd.: Method Of Energy Conversion Utilizing A Tubular Iceberg
4,167,099	Occidental Petroleum Corporation: Countercurrent Direct Contact Heat Exchange Process And System
4,170,878	Charles E. Jahnig, 5 Auldwood Lane, Rumson, NJ 07760: Energy Conversion System For Deriving Useful Power From Sources Of Low Level Heat

APPENDIX A - EXPLANATORY NOTES

Composite Total (Part 2B): Part 2C of each profile comprises an alphabetical listing of assignees. In some instances, assignees are listed in more than one place due to variations in the printing of the name. These variations occur for a number of reasons, such as typographical errors, changes in company names or differences in spacing or abbreviations. In Part 2B of each profile, which ranks assignees according to number of patents held, the number of patents listed for certain assignees may be a composite resulting from the combination of different titles which in fact signify identical assignees. An asterisk appears next to these totals. This will alert the reader that the particular assignee is listed under more than one title in Part 2C. Such assignees are listed below.

For: AGENCE NATIONALE DE VALORISATION DE LA RECHERCHE ANVAR
See Also: AGENCE NATIONALE DE VALORISATION DE LA RECHERE (ANVAR)

For: RAYTHEON COMPANY
See Also: RAYTHEON CORPORATION

For: UNITED STATES OF AMERICA, DEPARTMENT OF ENERGY
See Also: UNITED STATES OF AMERICA, ATOMIC ENERGY COMMISSION

For: UNITED STATES OF AMERICA, NATIONAL AERONAUTICS AND SPACE ADM
See Also: NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Application Filing Date: The application filing date information as set forth in Parts 1 and 2A of the profiles is determined by taking all of those patents which issued between 1967 and 1978 and distributing them yearly based on the date when the application was filed. Patents which were granted prior to 1967 are not included since the application date information for these patents is not in the data base. Also, applications which were filed but never issued (roughly 30% of the total filings), as well as those applications which were still pending as of December 31, 1978 are not included. Thus, only those applications which were filed and subsequently became patents with patent grant dates between 1967 and 1978 are included.

While the length of time between the patent application date and the patent grant date varies, the current pendency is approximately 20 months. Clearly many applications filed in 1978 were still pending at the end of 1978, as were a number of those filed in 1977. While a small number of applications which were filed prior to 1977 were still pending, OTAF feels that the application date data prior to January 1977 is essentially complete. That is, the number shown for applications filed in the years prior to 1977 will not differ substantially with the passage of time, and this number is a true reflection of the number of applications filed in that

year which have and will become patents. However, for the subsequent years, 1977 and 1978, that number will increase as more applications become patents.

For those years prior to 1967, it should be remembered that the numbers reflect only those applications which became patents between 1967 and 1978. Thus, the column "pre 65" does not reflect all applications filed before 1965 but only those which issued in 1967 and subsequently. The graph of this information in Part 1 of each profile is limited to the years 1967 to 1976 and thus is an essentially accurate reflection of activity based on the application dates of subsequently issued patents.

Assignee - This term refers to companies, organizations or individuals to which the inventor's titles and rights to a patent are assigned. For the purpose of this publication, the assignee will in all cases refer to the assignee at the time the patent was granted. Approximately 80% of all U.S. patents are assigned when granted. By far, the largest portion of assignees are corporations.

Country Codes - The following country codes appear in Part 2D of this profile. Due to changes in codes during the period covered, some countries are identified by more than one code.

AR - Argentina
AU - Australia
CA - Canada
CH - Switzerland
CR - Costa Rica
CT - Taiwan
DK - Denmark
DO - Dominican Republic
DT - Federal Republic of Germany
EN - England
ES - Spain
FR - France
IL - Israel
JA - Japan
NG - Nigeria
NZ - New Zealand
RP - Philippines
SC - Scotland
SE - Sweden
SF - Finland
SU - Union of Soviet Socialist Republics
SW - Sweden
WI - West Indies
ZA - South Africa

APPENDIX B

OBTAINING PREVIOUS OTAF PUBLICATIONS**

Copies of the previous OTAF publications listed below are available from:

National Technical Information Service (NTIS)
5285 Port Royal Rd.
Springfield, Virginia 22161
(703) 557-4690

When ordering from NTIS, please give the publication title and its "COM" or "PB" number.

1. Initial Publication, May 1973
   COM 73-10767; Cost: Domestic - $6.50 Foreign - $13.00
   Describes OTAF program and gives sample reports on 24 wide ranging areas of technology in varying levels of detail.

2. Early Warning Report, December 1973
   COM 74-10150; Cost: Domestic - $11.00 Foreign - $22.00
   Spotlights those technological areas experiencing a high level of overall activity or of foreign activity. Reviews patent activity in a number of energy areas, including nuclear; solar; geothermal; and tide, wind and wave energy.

3. Third Report, June 1974
   COM 74-11383; Cost: Domestic - $9.00 Foreign - $18.00
   Presents an overview of the technological activity, across all technologies, of a group of selected foreign countries and a group of selected U.S. states. Extends energy area treatments to include oil shale and coal gasification technologies. Reviews additional high overall activity technological areas.

4. Fourth Report: A Review of Patent Ownership, January 1975
   COM 75-10050; Cost: Domestic - $7.25 Foreign - $14.50
   Identifies the 73 corporations and government agencies which received 500 or more patents during the five year period 1969-1973, and reviews and compares their patent activity across the spectrum of technology. Also reviews in terms of patent ownership, the patent activity during the same period, in nuclear energy technology and oil shale and coal gasification technology.

5. Fifth Report, August 1975
   COM 75-11142, Cost: Domestic - $8.00 Foreign - $16.00
   Reviews 60 technological areas, not previously reported on, experiencing a high level of overall activity or of foreign activity. Presents patent activity data in categories corresponding to 36 Product Fields of the Standard Industrial Classification System.

** SPECIAL NOTE: NTIS AND GPO PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE.

6. Sixth Report, June 1976
PB 254188, Cost: Domestic - $9.00 Foreign - $18.00
Reviews 15 technologies with unusually high activity by foreign resident inventors, and 22 high overall activity technologies; updates the 1973 reports on patent activity in solar and other natural energy sources, and adds reports on the use of waste material and wind for energy generation. Presents comparisions of patenting to R&D expenditures and R&D manpower allocations in six selected industries. The report concludes with a review of six most often cited patents in 1975, 5 U.S. and 1 foreign patent.

7. Seventh Report, March 1977*
PB 265792, Cost: Domestic - $9.25 Foreign - $18.50
Reviews historical patenting and trademark registration trends, and includes the most extensive collection of historical U.S. patent data ever presented in a single publication. Makes first use in the series of data relating to patents granted by foreign nations for a study of invention sources. Makes first use in the series of pending patent application data for forecasting. Presents brief reviews of 16 technologies experiencing high overall or foreign patent activity. Concludes with the series most comprehensive assessment of activity in a given technology, specifically in computer memories.

8. Eighth Report, December 1977*
PB 276375, Cost: Domestic - $7.25 Foreign - $14.50
Reviews U.S. patenting in the context of domestic vs. international patenting and analyzes the balance of patenting between the U.S. and other countries. Presents a study demonstrating the uniqueness of patents and the patent file as a technological resource. Concludes with an in-depth analysis of patent activity in geophysical exploration for hydrocarbons.

9. Ninth Report, March 1979*
PB 293380 Cost: Domestic - $9.00 Foreign - $18.00
Reviews "Top Fifty" most active technologies (U.S.P.C. subclasses) in three categories -- Most Active, Fastest Growing, and Most Foreign-Active -- for each of three broad groupings of technology -- Chemical, Electrical and Mechanical. Examines trends in domestic patenting and independent inventor patenting. Includes an extensive review of patenting in "Ferrous Metal" technologies. Concludes with a discussion of two experiments in the transfer of "appropriate technology" to small businesses and developing countries.

NTIS Microfilm of Previous Reports
Domestic - $3.00 per report; Foreign - $4.50 per report

*NOTE: The Seventh, Eighth, and Ninth Reports may also be obtained from the Superintendent of Documents; U.S. Government Printing Office; Washington, D.C. 20402. Their identification numbers and costs are:

- Seventh Report 003-004-00542-4, price: Domestic **$4.25;
- Eighth Report 003-004-00550-5, price: Domestic **$3.75;
- Ninth Report 003-004-00559-9, price: Domestic **$4.00.

**Add 25% handling cost for foreign orders

APPENDIX C

OBTAINING ADDITIONAL INFORMATION OR SPECIAL REPORTS

Background

OTAF's computerized base of data relating to the patent file includes, at present:

- all subclasses of the U.S. Patent Classification System
- the relationship of all subclasses of the U.S. Patent Classification System to the Standard Industrial Classification System in 55 Product Fields and Product Field combinations
- for U.S. patents issued since 1963,
  - the ownership at time of issue in seven categories (U.S. government, foreign government, U.S. corporation, foreign corporation, U.S. individual, and unassigned)
  - the country or state of residence of the inventor
- for U.S. patents issued since 1967,
  - the date the application for patent was filed in the U.S. Patent and Trademark Office
- for U.S. patents issued since 1969,
  - the specific (i.e. named) ownership of all patents which, at time of issue, were organizationally owned (e.g., by a corporation, foundation, government agency).
  - the patent title
- for U.S. patents issued since 1975,
  - the address of the inventor, and the field of search and references cited in the patentability examination leading to the patent grant.

Special Reports

Data can be retrieved on the basis of any one or any combination of the factors listed above, manipulated on most any given basis and presented in a number of formats, e.g., lists, tables, graphs, charts, etc. This flexiblity is illustrated by the various types of reports presented in this Appendix and in the nine OTAF previous general distribution publications.

OTAF has developed several standard special report programs which are designed to extract and present, for any given grouping of patents, a wide variety of data. Excerpts from samples of reports prepared using these programs are included in this Appendix.

STANDARD SPECIAL REPORTS

"Technology Profile" Report

This is a multi-part report utilizing many of the elements in OTAF's data base to provide a detailed patent profile for a specific technology or grouping of technologies. Information provided includes rate of patenting, origin of patenting, type of assignment and specific assignment, patent numbers and their titles, and names and addresses of "independent" inventors. There are four parts (parts A,B,C,&D) which comprise a complete report. Part A includes patenting activity percentages, general assignment and distribution of origin of patents; Part B includes, by assignee, the numbers of patents granted by both year of application filing and grant date, ranked by assignee with highest number of patents; Part C includes, alphabetically, the assignees and their specific patent numbers and titles; Part D gives the name and address of the inventors of patents unassigned at time of issue. Any Part can be prepared depending on your needs. This PATENT PROFILES publication is itself an example of the kinds of data presented in a "Technology Profile" report.

"Organizational Profile" Report

Beginning on page 185 are excerpts from the second of OTAF's standard format special reports. The sample report profiles the patent activity across the classes and subclasses of the U.S. Patent Classification system. A report for Communications Satellite Corp. is given as an example. Two pages of the 40 page report are included. This type of report can be prepared, for example, on the patents of any organization or grouping of organizations, or on the patents granted to the residents of any state or country or grouping of states or countries.

Multi-Corporate Patent Activity Profile

Like the above described Organizational Profile, this report also profiles 1969-1978 patent activity across the classes and subclasses of the U.S. Patent Classification System. In this report the activity of up to eight organizations can be profiled simultaneously, facilitating comparisons between organizations. Unlike the Organizational Profile no patent numbers or patent titles are given.

SIC Product Field Reports

On pages 187 to 189 is a listing of Standard Industrial Classification (SIC) Product Fields for which a concordance exists with subclasses of the U.S. Patent Classification System. Special patent reports, such as the "Technology Profile" Report can be prepared for any of these Product Fields.

How to Obtain Special Reports

1. In making an initial determination of interest in a special OTAF report, you are urged to review the data items that are available and decide if any one or combination of them, or any relationship between two or more of them, might be useful to your needs. Special attention should be given to the standard format reports to determine if these multi-purpose, relatively low cost reports would meet your needs.

2. In most instances, interest, once determined, will be limited to particular technological areas or to particular organization owning patents. In the case of technological areas, their definition is of key importance and must ultimately be in terms of classes and sub-classes of the U.S. Patent Classification System (or one of the 55 SIC Product Fields or Field combinations). If you are unfamiliar with the U.S. Patent Classification System, develop as clear and precise an explanation of your area(s) of interest as possible. For assignment information, the parent organization and its subsidiaries of interest should be identified. Recent name changes (e.g. Esso-Exxon), if known, should be indicated.

3. At this point, you should contact OTAF, indicate the type of information you desire and, if you wish, what your needs are. (Perhaps alternatives can be suggested to better meet those needs). If you cannot provide class and subclass definition of your area of interest, OTAF will attempt to do that for you, using your description of the area.

4. Once there is a clear mutual understanding of the information you want, the format in which you want it and the area(s) to be included, an estimate of cost will be developed and provided to you along with a statement of the work to be done.

5. Once agreement on work to be done and cost is reached, and payment is received, the report will be prepared and provided.

Costs

All special reports are prepared on a cost reimbursable basis. These costs may vary widely - from as low as $50.00 for some forms of our standard format reports, to several thousand dollars for complex and large scale treatments of many technological categories, requiring extensive professional time, or programming and/or computer time. Cost estimates for specifically requested special reports will be provided prior to report preparation.

Whom to Contact

Inquiries concerning OTAF publications/services are invited and should be directed to:

Office of Technology Assessment
and Forecast
U.S. Patent and Trademark Office
Washington, D.C. 20231
Phone: (703) 557-3050

SAMPLE ORGANIZATIONAL PROFILE REPORT - COMMUNICATIONS SATELLITE CORPORATION

EXPLANATION OF DATA

DESCRIPTION OF PATENT PROFILES

THE REPORT PROFILES ONLY THOSE PATENTS FALLING INTO A PARTICULAR "CATEGORY" (E.G., SPECIFIC OWNERSHIP, COUNTRY OR STATE OF INVENTOR RESIDENCE), BY THE U.S. PATENT CLASSIFICATIONS INTO WHICH THOSE PATENTS HAVE BEEN PLACED.

EACH MAJOR PATENT CLASSIFICATION (CLASS) IS IDENTIFIED BY ITS TITLE. THEN, FOR EACH OF THE SUBCLASSES WITHIN THAT CLASS WHEREIN PATENTS FROM THE "CATEGORY" HAVE BEEN PLACED, THE FOLLOWING ARE GIVEN:

--TOTAL PATENTS
--OR (ORIGINAL) PATENTS
--XR (CROSS-REFERENCE) PATENTS
--PCT (PERCENT) OF TOTAL OR WITHIN THE "CATEGORY"
--PCT (PERCENT) OF ALL (OR & XR) PATENTS WITHIN THE "CATEGORY"

ALSO GIVEN ARE THE PATENT NUMBERS OF THE "CATEGORY" PATENTS IN THAT CLASSIFICATION. THE TYPE OF CLASSIFICATION (OR orXR) ASSIGNED TO EACH PATENT IS SHOWN IN PARENTHESES FOLLOWING THE PATENT.

FOR PATENTS ISSUING IN 1969 AND SUBSEQUENTLY, THE PATENT TITLES ARE GIVEN. (NOTE: ANY SYMBOLS IN A PATENT TITLE WHICH ARE NOT AVAILABLE ON THE COMPUTER PRINTER ARE SPELLED OUT, EG., β IS SHOWN AS BETA. SUPERSCRIPTS AND SUBSCRIPTS ARE INDICATED BY ENCLOSURE BETWEEN UPWARDLY OR DOWNWARDLY FACING SLASHES, E.G., $H^{\wedge}{}_{2}O$ IS SHOWN AS H/2 \ O AND $Y^{2}X$ IS SHOWN AS Y \2/X.)

PATENTS INCLUDED IN PROFILE

THE PATENTS INCLUDED IN THE REPORT ARE THOSE WHICH, ACCORDING TO THE DATA OF RECORD IN THE OTAF COMPUTER DATA BASE, FALL WITHIN THE CATEGORY COVERED IN THE REPORT. THESE CATEGORY DATA ARE RECORDED AT THE TIME OF PATENT ISSUE AND ARE ESSENTIALLY ACCURATE. HOWEVER, ANY PATENT LISTING OR DATA PROVIDED IN THIS REPORT SHOULD NOT BE CONSIDERED TO BE INCLUSIVE OF ALL RELEVANT PATENTS, NOR EXCLUSIVE OF ALL NON-RELEVANT PATENTS.

CLASS 179 - TELEPHONY

SUBCLASS 100.3 A (CONTINUED)

3795768 (XR) - HOLOGRAPHIC IMAGE SCANNER/RECORDER SYSTEM

SUBCLASS 100.3 G	TOTAL	1	(OR)	0	(XR)	1	PCT OF TOTAL OR	0.0	PCT OF ALL (OR+XR)	.2

3795768 (XR) - HOLOGRAPHIC IMAGE SCANNER/RECORDER SYSTEM

SUBCLASS 170.2	TOTAL	8	(OR)	6	(XR)	2	PCT OF TOTAL OR	4.3	PCT OF ALL (OR+XR)	1.6

3780233 (OR) - ADAPTIVE ECHO CANCELLERS WITH COMPANDORS
3789165 (OR) - ECHO CANCELLER WITH VARIABLE THRESHOLD
3836734 (OR) - ADAPTIVE ECHO CANCELLER WITH MULTI-INCREMENT GAIN COEFFICIENT CORRECTIONS
3894200 (OR) - ADAPTIVE ECHO CANCELLER WITH DIGITAL CENTER CLIPPING
4021623 (OR) - AUTOMATIC M-REGISTER CLEAR FOR PREVENTION OF ERRONEOUS CONVOLUTION IN DIGITAL ADAPTIVE ECHO CANCELLE R
4064379 (OR) - LOGARITHMIC ECHO CANCELLER
3937907 (XR) - DIGITAL ECHO SUPPRESSOR
4031338 (XR) - ECHO SUPPRESSOR USING FREQUENCY-SELECTIVE CENTER CLIPPING

SUBCLASS 170.6	TOTAL	5	(OR)	4	(XR)	1	PCT OF TOTAL OR	2.9	PCT OF ALL (OR+XR)	1.0

3725612 (OR) - ECHO SUPPRESSOR BREAK-IN CIRCUIT
3896273 (OR) - DIGITAL ECHO SUPPRESSOR
3937907 (OR) - DIGITAL ECHO SUPPRESSOR
4024358 (OR) - ADAPTIVE ECHO CANCELLER USING DIFFERENTIAL PULSE CODE MODULATION ENCODING
3894200 (XR) - ADAPTIVE ECHO CANCELLER WITH DIGITAL CENTER CLIPPING

SUBCLASS 170.8	TOTAL	1	(OR)	1	(XR)	0	PCT OF TOTAL OR	.7	PCT OF ALL (OR+XR)	.2

4031338 (OR) - ECHO SUPPRESSOR USING FREQUENCY-SELECTIVE CENTER CLIPPING

TOTAL CLASS 179	TOTAL	76	(OR)	43	(XR)	33	PCT OF TOTAL OR	30.7	PCT OF ALL (OR+XR)	15.5

CLASS 200 - ELECTRICITY, CIRCUIT MAKERS AND BREAKERS

SUBCLASS 8 A	TOTAL	1	(OR)	0	(XR)	1	PCT OF TOTAL OR	0.0	PCT OF ALL (OR+XR)	.2

3740499 (XR) - OIL FILLED STEPPING SWITCH

SUBCLASS 8 B	TOTAL	1	(OR)	1	(XR)	0	PCT OF TOTAL OR	.7	PCT OF ALL (OR+XR)	.2

3740499 (OR) - OIL FILLED STEPPING SWITCH

SUBCLASS 11 TC	TOTAL	1	(OR)	0	(XR)	1	PCT OF TOTAL OR	0.0	PCT OF ALL (OR+XR)	.2

3740499 (XR) - OIL FILLED STEPPING SWITCH

TOTAL CLASS 200	TOTAL	3	(OR)	1	(XR)	2	PCT OF TOTAL OR	.7	PCT OF ALL (OR+XR)	.6

SIC PRODUCT FIELDS

PRODUCT FIELDS	SIC CATEGORY
Food and Kindred Products	20
Textile Mill Products	22
Chemicals and Allied Products	28
Chemicals, Except Drugs & Medicines	281, 282, 284-289
Basic Industrial Inorganic & Organic Chemistry	281, 286
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APPENDIX D

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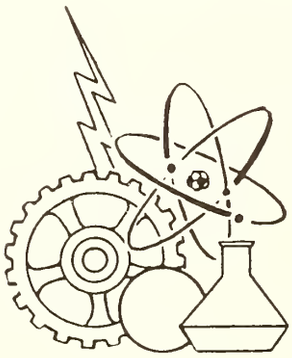

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